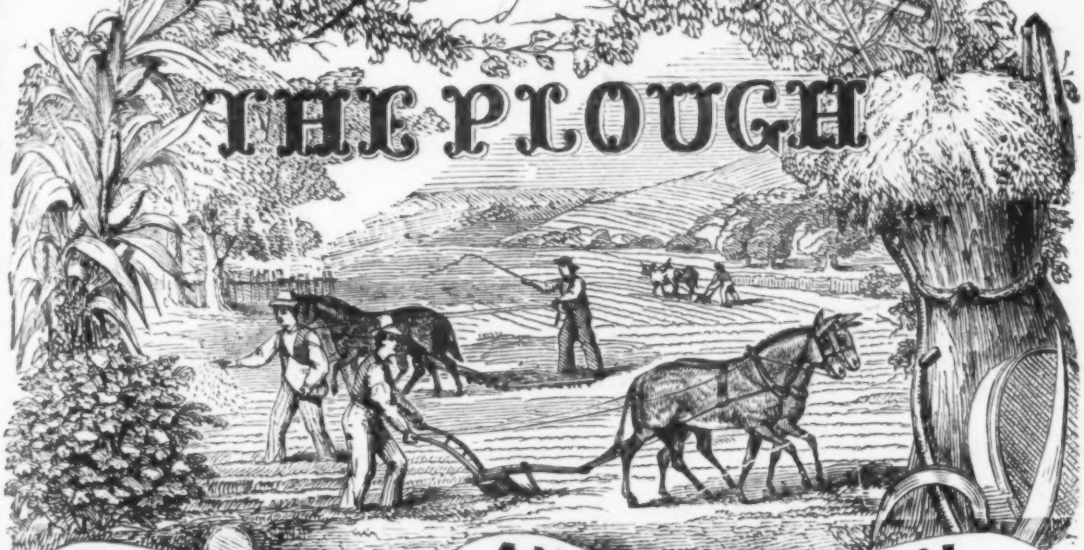
VOL. VI. MARCH, 1853. NO. 3.

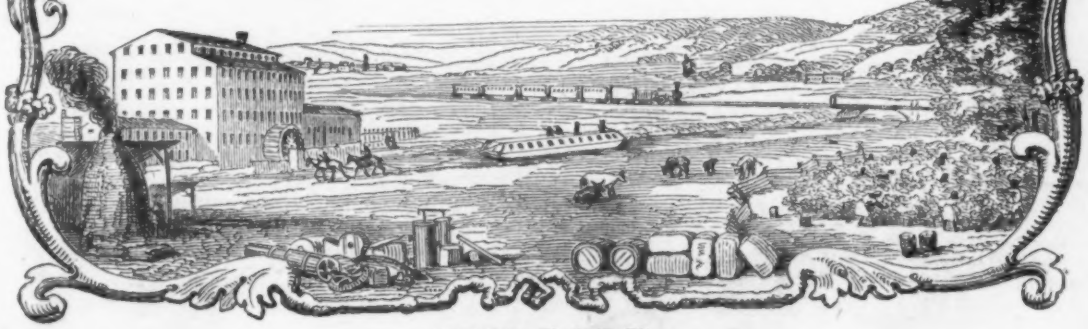
# THE PLOUGH



## THE LOOM AND THE ANVIL.

## FARMER AND MECHANIC.

F. G. SKINNER AND MYRON FINCH, EDITORS.



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# The Plough, the Loom, and the Anvil.

EDITED BY F. G. SKINNER AND MYRON FINCH.

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# The Plough, the Loom, and the Anvil.

VOL. VI. MARCH, 1853. No. 3.

## TO THE HON. R. M. T. HUNTER,

CHAIRMAN OF THE COMMITTEE ON FINANCE, OF THE SENATE.

(Letter Third.)

SIR,

IT is possible that you may suppose I have overestimated the effect produced on the market of England by the supply of food from this country and Canada, and of course overestimated the advantage that would result to our farmers from making at home a market that would relieve them from the necessity of exporting food in its original form; and having just met with some facts tending to throw much light on the subject, I lay them now before you.

The London *Economist* of November 13 furnishes the following statement of stocks and prices of sugar in the principal markets of Europe:—

| | 1849. | 1850. | 1851. | 1852. |
|---|---|---|---|---|
| Stocks..... cwt. | 3,563,000 | 2,895,000 | 3,810,000 | 3,216,000 |
| Prices—duty free—Havana brown.... | 17 to 24*s.* | 20 to 27*s.* | 16 to 22*s.* | 19 to 26*s.* |
| " Brazil brown..... | 16 to 20*s.* | 18 to 22*s.* | 12 to 17*s.* | 16 to 20*s.* |

The stocks of 1849 and 1852 were, as you see, nearly alike, and the prices did not greatly differ. Taking them, therefore, as the standard, we see that a *diminution* of supply so small as to cause a diminution of stock to the extent of about 400,000 *cwts.*, or only *about three per cent. of the import*, added about *fifteen per cent.* to the prices of the whole crop in 1850; whereas a similar *excess* of supply in 1851 caused a reduction of prices almost as great. The actual quantity received in Europe in the first ten months of the present year has been 509 cwts. less than in the corresponding months of the previous one. The average monthly receipts are about a million of cwts. per month, and if we take the prices of those two years as a standard, the following will be the result:—

| | | | |
|---|---|---|---|
| 1851..... | 12,000,000 cwts. | Average 16*s.* 9*d.*..... | £10,050,000 |
| 1852..... | 11,500,000 " | " 20*s.* 3*d.*..... | 11,643,750 |
| Gain on the crop..... | | | 1,593,750 |

If now we compare 1850 with 1851, the following is the result:

| | | | |
|---|---|---|---|
| 1851 as above..... | | | 10,050,000 |
| 1850..... | 11,000,000 cwts. | Average...21*s.* 9*d.*..... | 11,971,250 |
| | | | 1,921,250 |
| Now if this reduction of export had been a consequence of increased domestic consumption, we should have to add the value of that million to the product, and this would give..... | | | 1,187,500 |
| | | | £3,108,750 |

We have here a difference of thirty per cent. resulting from a diminution of export to the amount of one-twelfth of the export to Europe, and not more than a twenty-fourth of the whole crop. Admitting the crop to have been 24,000,000 of cwts., and it must have been more, the total difference produced by this abstraction of four per cent. from the markets of Europe

would be more than six millions of pounds, or thirty millions of dollars. Such being the result of a difference of four per cent. is it not quite certain that if the people of Cuba, Brazil, India, and other countries were to turn some of their labour to the production of cloth, iron, and other commodities for which they are now wholly dependent on Europe, and thus diminish their necessity for export to the further extent of two per cent., the effect would be almost to double the value of the sugar crop of the world, to the great advantage of the planter, who would realize more for his sugar while obtaining his cloth and his iron cheaper? To me it seems quite certain that such would be the case.

The same number of the *Economist* contains facts in relation to the coffee trade tending to nearly the same result, and showing how large is the reduction of prices consequent upon a very small excess of supply, precisely as has been so often shown to be the case with cotton. It is well known that a crop of two millions of bales of the latter will produce more than one of two and a half millions, and yet our planters will insist upon a course of policy tending to force almost their whole crop upon the English market, there to build up a "stock on hand" to be used by the men of Manchester in diminishing the value of the crop coming to market. Examine the facts where you may, you will find that all experience tends to favour the correctness of the views I have furnished in regard to food; and that if the farmer or planter desires to grow rich his only course for the accomplishment of that object is to be found in the adoption of measures that will enable him to release himself from the oppressive monopoly of machinery established by England, and which she desires to perpetuate by the aid of the system called free trade.

The men who raise sugar have scarcely any intercourse even with their immediate neighbours except that which is carried on through the medium of Liverpool and London. One Hindoo sends his cotton, and another his sugar to Manchester, and at the expiration of a couple of years a small portion returns to them in the form of cloth; and thus it is that men make exchanges who live at a distance of a few miles, or hundreds of miles, from each other. So is it with the cultivators both in Brazil and Mauritius. They can make no exchanges with each other any more than can the cotton planter of Alabama with the sugar planter of Louisiana or Texas. Your fellow-citizens of Virginia have little trade with each other, because you are all producers of wheat and tobacco; and as a necessary consequence of this absence of trade among themselves, they have none with their immediate neighbours. Richmond has little to do with New Orleans or Charleston, and perhaps less with Louisville or Nashville. Your exchanges among one another *must* all be made through New York or Philadelphia, Boston or Baltimore—but chiefly through the first; and the reason that they must be so is, that it does not accord with the policy of England to permit that there shall be diversification of labour among her colonies, and as yet we are only British colonies. If you converted your food into coal and iron, and food and cotton into cloth, you would need to exchange iron for cotton, and then Norfolk and New Orleans would trade together; but as it is they cannot do it. This absence of domestic intercourse among the Southern states has been exhibited in a striking manner on a recent occasion, when it was attempted to carry slaves to New Orleans from Richmond, through New York. Had Richmond had any trade with New Orleans it would not have been necessary to travel so far out of the way, at so much risk. Real free trade would constitute a great pyramid, the base of which would be a great intercourse among yourselves, the producer of food exchanging with the producer of cloth and iron; and every step

in that direction would be attended with an increase of foreign trade: but *so long as you have no domestic trade you can have little or no foreign trade.* The little that your State now has results from the fact that you *manufacture* some of your wheat into flour.

The necessary consequence of the centralization of the exchanges of the world in Great Britain is a corresponding centralization of the exchanges of nations in single cities. Almost all those of India are made in Calcutta and Bombay, to which are brought the rice and the cotton of the whole nation that the people may there exchange with each other; and thus are those cities built up at the expense of the whole people of India, whose spindles and looms have been destroyed by the working of the British monopoly. The splendour of Calcutta increases as the wretchedness of the people of India is augmented; for the more the cultivator is deprived of the aid of the artisan the more is he thrown into the power of the trader. So precisely is it among ourselves. The people of Virginia make a large portion of their exchanges, even among themselves, through New York; and the cotton manufacturer of South Carolina sends his goods to New York *there to be purchased by the shop-keeper of Camden, Charleston, or Hamburgh, burdened with enormous cost of freight and commissions.* Your own journals, on occasion of a recent grievance, have said:—

"*Let Virginia look to Virginia.* Let her sustain her own trade—support her own commerce—stand upon her own bottom. The ocean lies open before us; ere long her sails may whiten every port, and her steamers 'walk every sea.' Self-interest, self-respect, State dignity, demands of her legislature a calm but enlightened, resolute but conciliatory course."—*Richmond Whig.*

All this would be true if Virginia *would* "look to Virginia." As it is she *must* go to New York, and the reason why she must do so is that the tendency of the present system is toward centralization and monopoly, to the impoverishment of the farmer and the planter. It tends to place all the cotton and woollen machinery in the North and East at a distance from the men who produce the cotton and the wool—and all the iron-making machinery of the Union in Pensylvania, while Virginia and Tennessee, Missouri and Minnesota, are to be compelled to forego all the advantages that would result from the opening of their mines and the smelting of their ore. It tends to centralize all the trade of the Union in the single port of New York—and *that centralization is the result of the policy known among us as free trade,* advocated, as it is, by gentlemen who for twenty years have looked anxiously for the adoption of some measures tending to promote the commercial independence of the South. What has been the progress in that direction of the last eighty years will be seen by the following comparative statement of imports:—

| | New York. | Virginia. | South Carolina. |
|---|---|---|---|
| 1769..... | £ *stg.* 189,000..... | £851,000..... | £555,000 |
| 1821..... | $23,000,000..... | $1,078,000..... | $3,000,000 |
| 1832..... | 57,000,000..... | 550,000..... | 1,213,000 |
| 1851..... | 141,000,000..... | 552,000..... | 2,081,000 |

Why should this be so? Why is it that Norfolk has no foreign trade? It is because Virginians have no trade among themselves; because they will not avail themselves of their vast deposites of coal and ore, and of their vast water power, deeming it cheaper to send food to New York, to go thence to Liverpool, thus to be eaten by men, women, and children that make cloth by aid of English coal, than to feed it directly to people who made it by aid of the falls of the James or of the Potomac, capable as they are of making all

the cloth and all the iron consumed in their State, were they even ten times greater in quantity than they now are. It is because Virginia has been determined *not* to qualify herself for direct trade with the world. She has nothing to give to the world but raw products, and she has to compete for the sale of them in New York, Boston, and Liverpool. She exhausts her land, and then she obtains, as Mr. Stevenson informs us, but six or eight bushels of wheat to the acre, and that wheat she sends to the North to be exchanged for hay, while thousands of acres of well-timbered land, capable of yielding hay in profusion, may be had, as I understand, in the lower part of the State, at from three to five dollars per acre. Marl abounds everywhere, and yet her people are flying in every direction to seek new lands in the West, to be exhausted, as they have already exhausted so large a portion of the State. Her people are being impoverished and they are leaving the State, and from year to year they have less power to purchase foreign commodities. When men abandon lands that they have cultivated, we may be quite sure that they have small means with which to purchase cloths, silks, or iron. How many of our population, says Mr. Stevenson—

"Do we see disposing of their lands at ruinous prices, and relinquishing their birthplaces and friends, to settle themselves in the West; and many not so much from choice as from actual inability to support their families and rear and educate their children, out of the produce of their exhausted lands—once fertile, but rendered barren and unproductive by a ruinous system of cultivation.

"And how greatly is this distress heightened, in witnessing, as we often do, the successions and reverses of this struggle between going and staying, on the part of many emigrants. And how many are there, who after removing, remain only a few years, and then return to seize again upon a portion of their native land, and die where they were born. How strongly does it remind us of the poor shipwrecked mariner, who, touching in the midst of the storm the shore, lays hold of it but is borne seaward by the receding wave; but struggling back, torn and lacerated, he grasps again the rock, with bleeding hands, and still clings to it, as a last and forlorn hope. Nor is this to be wondered at. Perhaps it was the home of his childhood—the habitation of his fathers, for past generations—the soil upon which had been expended the savings and nourishment, the energies and virtues, of a long life—'the sweat of the living, and the ashes of the dead.'

"Oh! how hard to break such ties as those.

"This is no gloomy picture of the imagination; but a faithful representation of what most of us know and feel to be true. Who is it that has not had some acquaintance or neighbour—some friend, perhaps some relative, forced into this current of emigration, and obliged from necessity, in the evening, probably, of a long life, to abandon his State and friends, and the home of his fathers and childhood, to seek a precarious subsistence in the supposed El Dorados of the West?"*

This is a terrible picture, and yet it is but the index to the worse one that must follow in its train. Well does the hon. speaker say that—

"There is another evil attending this continual drain of our population to the West, next in importance to the actual loss of the population itself, and that is, its tendency to continue and enlarge our wretched system of cultivation.

"The moment some persons feel assured that for present gain, they can exhaust the fertility of their lands in the old States, and then abandon them for those in the West, which being rich require neither the aid of science nor art, the natural tendency is at once to give over all efforts at improvement themselves, and kill their land as quickly as possible, then sell it for what it will bring or abandon it as a waste. And such will be found to be the case with too many of the emigrants from the lowlands of Virginia."

* Address delivered before the Albemarle Agricultural Society, by Hon. Andrew Stevenson.

It has been estimated (Census Report 1849) that we waste *annually* as much of the materials of which grain is composed as would produce 500 millions of bushels of wheat, or 1000 millions of bushels of corn; and it is stated, on the same authority, that no State in the Union has done so much of this as Virginia: the one which is most exclusively given to agriculture. Is there not here evidence that her people can never thrive at a distance from the anvil and the loom?

Contrast, I pray you, the picture offered by Mr. Stevenson, with the following view of the price of land near New York:—

"The farm of Mr. Polhemus, situated between Astoria and Ravenswood, of 100 acres, sold a few days since for $50,000, being $500 per acre. Another farm of 40 acres near Astoria, which belonged to the late Isaac Van Alst, sold for $35,000, $870 per acre."

The New York papers of the day inform us, that so rapid has been the growth in the value of city property, that a gentleman has just realized $100,000 profit on the sale of one-half of a few city lots purchased but a short time since; and similar operations of greater or less extent are being made from week to week, if not from day to day. If you desire to know the cause of this, you may find it in the fact that the policy of Virginia and the South tends to exhaust and depopulate themselves, and to prevent them from having any trade, *even among themselves*, except through that single port, which is thus built up at their expense. Congress is now making large grants for roads, *each one of which is a bounty on emigration from all the older settled States*, to the injury of every man in those States that owns an acre of land. How it has operated in Virginia for the last twenty years you know, but as you may not know how it now works in the western States, I give the following extract from a letter from a gentleman of Michigan:—

"We could once sell our farms for fair prices and for cash, but at present we cannot sell an improved farm for more than from $7 to $10 per acre, while it has cost the pioneer from $10 to $15 per acre, to make the improvements! And then we cannot sell for *cash*, but on *credit*. I have been engaged in the land trade for some twenty years, and at no time have I known real estate so great a drug in the market. There are thousands who want to buy, but they have no money. If they are mechanics or labourers, they work for store-pay, and with that they cannot buy land. I speak for Michigan, and suppose it is so in all the older western States."

Similar are the results of the depopulation now going on in all the older of the States of the Union; and the more men scatter abroad the greater is the growth of centralization. The man who makes iron in Pennsylvania or Virginia, exchanges with the neighbouring farmer for food; but from the moment of his departure to farm in the west, *both* must look to New York as the only place at which to make their exchange. The lead miner of Illinois buys food from one neighbour and sells lead to another; but when you close the mines, and drive him to raising food, *all must look to New York*.

But recently Congress made large grants for a road through Illinois, and the persons who procured that grant are said to be certain to realize from it a profit of twenty millions of dollars. Where are they to be found? In New York. That road offers a bounty upon emigrants from Pennsylvania and Virginia; and the greater the emigration from both the greater the centralization of trade in New York, and the greater the power of Wall street to buy up new lands and to pay largely for grants of public lands in aid of roads. The tendency of the whole system is thus to build up a central power to control the operations of the farmer and planter of the Union. Lands are asked

for roads through the south and west, and other roads across the continent to California; and each of these will become the object of speculation in Wall street, while each will be a bounty on emigration from the old States of the Union, with hourly increasing tendency to centralization of trade, and with vast increase in the value of New York lots, and decrease in the value of land in the older States. I have now before me a letter from a gentleman of South Carolina, in which he says that in that State they make nothing but in the "increase of stock;" and such is, to a great extent, the case in other Southern States. *Every railroad South and West is centrifugal in its tendency.* While the centripetal force existed to some extent under the tariff of 1842, no injury could result from this; but now that we build neither mills nor furnaces, and now that the whole energies of the nation are given to the making of roads for the purpose of attracting the population of the older States, the worst effects may be anticipated.

I would now beg you to remark how the system called free trade—that which looks to securing to the manufacturer of England a monopoly of the trade of the world—has operated in your State, as compared with the protection which looks to the opening of your coal and iron mines, thus to make a market for your food. The decennial period 1830–1840 was emphatically a free trade one. The compromise was soon to bring an horizontal duty of twenty per cent.; and from the date of its passage we built few mills or furnaces, while millions of people fled to the West. In that ten years the population of your State increased only..... 28,392
The following period was emphatically one of concentration. In 1841, the West, exhausted by the making of roads with borrowed money, offered no inducements to emigration from the old States. In the following year the tariff was passed, and that endured until 1847. The great rail-road speculation of England kept up prices in 1847 and part of 1848, and it was not until 1849 that we began fully to realize the effect of the change. Almost the whole decade was a period of perfect protection, and the effect of this is seen in the fact that your State increased in numbers to the extent of..... 185,067
or almost seven times as much as it had grown in the previous period.

Compare this now with the growth of New York and Brooklyn. In ten years they grew 260,000; whereas in twenty years your great State grew 213,000, when it might have doubled itself, had the policy of the South tended to permit it to bring into activity its vast resources in coal and iron, and to enable its people to maintain trade among themselves, as the basis upon which to erect a trade with the world. Were she to make a market on her land for its products, and thus enable her to relieve herself from the perpetual loss of all the valuable elements of production, she could support five times her present population, and that would give her about a hundred to the square mile; whereas Belgium, the most prosperous country in Europe, has more than twice that number.

Pennsylvania has recently increased her representation, and the reason why she has done so is, that much of the State has not only ceased to export food, but has become an importer of it. In the last decennial period, Schuylkill county alone grew in number 28,000, or more than the growth of all Virginia in the previous one; and the consequence of that growth has been, that the farmers of Schuylkill and other counties can not only sell all their wheat at the highest prices of New York and Boston, but they can also sell potatoes, cabbages, and hay, and put the manure yielded by them back on their land: as could the people of Virginia, if they would but mine ore and coal and make iron.

It would seem to be time for Virginians to understand that the plough and the harrow never have thriven when separated from the spindle and the loom, and that the road to prosperity is to be found in the adoption of measures tending to enable them to export their food in the form of coal, iron, and cloth. Let them do this, and they may have direct intercourse with the world. The little they now have results, as I have said, from the fact that they *manufacture* their wheat into flour. Let them go one step farther and manufacture it into iron and cloth, and then they will be enabled to enrich their land—to find a market for labour—to clear their rich lands now covered with timber—to make roads—and thus labour and land will acquire a value, and population will be attracted to the State instead of being, as now, repelled from it. Massachusetts makes a market on her land for all its products, and she imports both men and food, and therefore her poor soil grows rich, and her lands sell for hundreds of dollars per acre, while she herself increases in power. Your State, on the contrary, exports both food and men, and land declines in value as she herself declines in power; and from being the first State in the Union she has now become the fourth, with every prospect of becoming soon the eighth, unless she shall adopt the policy tending to bring into activity her vast resources of coal, iron, lime, marl, water power, and, indeed, almost every thing required to enable her to become, if she will, a powerful nation of herself. The representation of New York has risen from 5 to 33, while that of your State has risen from 10 to 13, and yet your whole policy looks to compelling every man in Virginia to see in New York the only place of exchange, whereas Norfolk has every advantage that could be desired for becoming one of the most important seaports of the Union, as it will become whenever you shall determine to become *importers of men and raw materials*, instead of being, as now, *exporters of both*.

It is proposed now to hold an Agricultural Congress of the slaveholding states, for the following purposes:

"To adopt measures to improve the present system of agriculture; to develop the resources and combine the energies of the slaveholding States, so as to increase their wealth, power, and dignity, as members of the confederacy; to fortify a public opinion within the borders of the slaveholding states, in antagonism to that without; to enforce the growing sentiment that the children of the South shall be reared and educated at home, instead of abroad; to foster scientific pursuits, promote the mechanic arts, and aid in establishing a system of common schools; to assist in bringing the South in direct commercial intercourse with distant countries; and to 'cultivate the aptitudes of the negro race for civilization, and consequently Christianity—so that, *by the time that slavery shall have fulfilled its beneficent mission in these States*, a system may be authorized by the social condition of that race here, to relieve it from its present servitude, without sinking it to the condition of the free negroes of the North, and West Indies.'"

How shall these things be accomplished? Is it by further maintaining the system that has reduced the southern consumption of cotton to 75,000 bales after it had reached 120,000 by the aid of the tariff of 1842? Is it by maintaining a system that drives your people from the neighbourhood of coal and iron mines, where they would be customers to your farmers, to buy farms in the West where they must be rivals to them? Is it by scattering her people throughout Texas and Alabama that Virginia can acquire power to make roads, or to build school-houses? Is it by impoverishing her land and diminishing her power of maintaining trade that she can obtain direct trade with the various nations of the earth? Is it by diminishing her representation in Congress that she can maintain her dignity? Assuredly not. If Virginia

and the South desire to do these things they must awaken to the fact that all the purely agricultural communities of the world are poor and weak, and are becoming daily poorer and weaker, while all those who bring the loom and the anvil to the side of the plough and the harrow are becoming daily richer and stronger. Let them awake to the great fact that what they need is to raise the price of raw materials, and that that object can never be attained by forcing food or cotton into the market which now regulates the prices of the world, and which is kept by men whose interests look to having CHEAPER FOOD, CHEAPER TOBACCO, and CHEAPER COTTON. Let them awaken to the further fact that what they need is a larger supply of manufactured goods, and that that object can never be attained by compelling themselves to draw all their supplies from one market kept by men whose interests lead them to desire to sell DEARER CLOTH and DEARER IRON. Their objects and those of the people of Manchester and Birmingham are directly the opposite of each other—yet how few of them there are who study political economy in any but the books of the Manchester school, which teach that the true interests of the farmers and planters of the world are to be promoted by following the plough exclusively, and thus depriving themselves of all the aid afforded by the powerful steam—by having no employment but that which requires more physical power, and thus stunting the growth of intellect while rendering valueless the labour of the young and the aged, and driving the women to the field—and by exhausting the land by taking from it all the valuable portions of the soil to be transferred to Great Britain, there to be added to her already vast supply of manure, valued, as it now is, at above one hundred millions of pounds sterling, and *as much as all the cotton, rice, tobacco, sugar, wheat, and corn produced in all the states south of Mason and Dixon's line.*

Each successive steamer brings advice of the wonderful prosperity of England under free trade, and that prosperity is adduced by all the papers in the pay of foreign agents as a reason why we should follow out the great example set for us across the ocean. If, however, we enquire in what that prosperity consists, we find that it means cheap food and high-priced iron—cheap cotton and high-priced cloth. If next we enquire why food and cotton are cheap, we learn that it is because our present system compels us to force on the European market large supplies of both that should be consumed at home. If we enquire why it is that cloth and iron are high, we learn that it is because the same system compels us to look abroad for large supplies of both that should be made at home.

Throughout the South there are thousands of men who see that what they need is protection, but who refuse to adopt it because, as they say, it will benefit the North and East, and increase their power; and yet, if they would but examine the matter carefully, they would find that every measure they have yet adopted for weakening the North has strengthened it as compared with the South. The tariff of 1833 broke down thousands of manufacturing establishments at the north, but they rose again under that of 1842, and with improved machinery can now almost set at defiance all attempts at interference; but the factories of the South, once down, do not speedily revive again. Had the tariff of 1842 been maintained, the mills of the southern states would now count almost by hundreds, and they would be approximating daily to an equality with the people of the North in manufacturing power, but as it is they are forcing on the centralization of machinery in the North. So, too, with the manufacture of iron, which is daily centralizing itself in Eastern Pennsylvania, where improved machinery will probably, and

at no distant day, set at defiance domestic and foreign competition. The woollen mills of the West may be broken down, but those of Lowell will prosper under the existing system, and live even through the next revulsion.

The tendency of the present system is to place the farmer, bound hand and foot, at the mercy of the trader, and to give him a steadily decreasing reward for his labour. Our population, growing at the rate of almost a million a year, is now being driven in excessive numbers into agriculture that we may supply foreign nations with food, and yet the population of the only food-purchasing country of Europe is diminishing, and promises to diminish steadily for years to come. In that market the people of Virginia are to compete with those of Russia, whose crops are thus described:

"The crops in South Russia this year have surpassed all calculation. The Mennonite Colonies alone will have over one-and-three-quarter millions bushels of grain for export. The demand for labourers has been so great in the fields that the shops of the tailors, shoemakers, and stone-cutters were all deserted during harvest. Every day is bringing these countries nearer to England."

"*Every day is bringing these countries nearer to England.*" In this single sentence you may read the cause of the low price of wheat in England; and if you now look to the fact that almost every measure before Congress has for its object to increase the number of producers of wheat, and to bring them nearer to you and to England, you will, I think, have little difficulty in satisfying yourself that the course of your State, which should be the first in the Union, must continue to be downward, without a change of system. The quantity of land for which warrants are now in market is almost fifty millions of acres, and there is probably half as much in the hands of speculators in New York, Boston and other cities, all of whom are at work to obtain appropriations for roads, that they may have the lands "brought nearer to England;" and with each new grant, trade and power tend more and more to centralize themselves in New York: and yet the South, while it maintains the system, talks of commercial independence and direct trade!

The artisan has everywhere been the safeguard of the agriculturist; and where the former has not been found, the lattter has always been, *and always must be*, the slave of the trader. The celebrated Resolutions of '98 constitute, as it is declared, the basis of the democratic platform. They were levelled against political centralization, but unhappily the policy of Virginia and the South looks to a system of centralization that has everywhere proved itself far worse—that which places the farmers and planters under the control of merchants and traders. The city of New York governs the Union, and the governing power therein largely consists of the agents of the trading people of Europe, all busily engaged in establishing and maintaining what they call free trade. Their means, as there is good reason to believe, contributed much to the passage of the act of 1846,* and those means are still largely used to perpetuate that policy. Look, I beg of you, to the thousand schemes for railroads, and for steamers to Europe and California, for which congressional aid has been asked, and see how large a portion of them have their origin in the desire to perfect the commercial centralization that now exists. Among the most striking instances of this is the effort that has been made to obtain a Branch Mint in that city. California needs to sell gold—the manufactured article—and to be relieved from the necessity for selling gold dust;

* A recent English journal states that £80,000 were raised in Manchester to secure the passage of the act of 1846.

and the reason why she does so is found in the fact that the value of the raw product of the earth was found to have increased one dollar per ounce as soon as the place of manufacture was brought to the side of the producer. From that moment the State could maintain direct intercourse between the producers and consumers of her products; and it was to carry out and perfect this system that Congress was willing to expend the large sum required for a California Mint. Such a measure, however, would diminish centralization, whereas a New York mint would maintain it where it now stands, and therefore no amount of pecuniary or political influence was spared in the effort to accomplish the object. The objects of New York and Manchester are precisely the same. Having looked at these things, I will ask you to examine next the votes on numerous bills for promoting centralization, and remark that they have generally been passed by aid of the very gentlemen who most desire to see established the commercial independence of the South. That independence can never be established by aid of a system that compels South Carolina and Virginia to buy all their cloth and their iron in England, *because that trade must be carried on through New York.* It may and will be abolished whenever those States shall determine to convert their wheat and their cotton into cloth, iron, and coal, for those commodities can be exchanged without passing through this one great commercial centre of the Union. In saying this, I beg you to understand that I am quite convinced that the real prosperity of that city would be greater and more permanent under a system that would enrich the South and West than they ever can be under one which tends to the impoverishment of the Union. She would grow as fast, but they would grow faster, and more equality would be maintained.

Look at the palaces now going up in New York, and other cities. Look at the magnificence of hotels erected at a cost of two, three, or four hundred thousand dollars each. Who pay for them? Not the owners, for *they produce nothing.* All they do is to stand between the consumer and the producer and grow rich at the cost of both. Having studied New York, I would beg you to look at Norfolk, with one of the finest situations in the country—one that should make it one of the first cities of the world—and then to mark the character of its buildings and the growth of its population—3,400 in ten years!

Look, I beg of you, to the rents now being paid in New York, of six, eight, ten, and even twenty thousand dollars for single buildings of moderate size, and then enquire who are they that pay them. Are they the occupants? Assuredly not. They are paid by the people of Illinois and the West, of Virginia and the South, who *must* go there to exchange wool for cloth, and food for iron. Look next to the rents of Norfolk, and then at her magnificent bay, close at hand, and capable of affording shelter to the assembled fleets of the world. Then pass up the James and the Potomac, and see how clearly it has been provided that Virginia should be a great road of communication between the Mississippi and the ocean, and how abundantly have been provided the food, the coal, and the iron ore needed for making the roads, if Virginia could but persuade herself to "look to Virginia." That done, I would ask you to study the great system of roads now in preparation, and see that, almost without exception, they tend to carry trade *from* southern cities and *to* New York. Even New Orleans is losing her trade; and the day is probably not far distant when little will remain of that which but recently she had with Missouri and Illinois, Kentucky and Indiana. Tobacco and cotton now reach New York by canal and railroad;

and what is at this moment true of the products of Kentucky and Tennessee, will soon probably be equally true in regard to Mississippi and Alabama. Commercial centralization becomes from day to day more perfect, as each day adds to the *necessity* for resorting to a single place of exchange, and increases the facilities offered there as compared with other parts of the Union.

Every movement points in the same direction. The more we *must* look to foreign trade the more we need a navy, the expenditures of which are now almost as great as were those of the whole government only twenty years since. Two thousand more seamen are now asked for, that we may have more ships; and the more ships we have the more employment for them must be found. And therefore it is that we have new expeditions of discovery in all directions, and that we are now sending a fleet to Japan for the accomplishment of objects that would have remained unthought of had not the whole policy of the government looked to building up foreign trade on the ruins of domestic trade. A law of three lines, rendering permanent even the present duties paid by cloth and iron, would add more in a year to the trade of the Union than will all these expeditions in a century. Such a law, however, would not promote centralization. It would not enable thousands to look to the Treasury for support, and therefore it would not be popular among the people who now so largely control the action of Congress. It would look towards having a really democratic and economical government, while a large navy and well-appointed expeditions look toward a splendid and expensive one; and yet this latter course is sustained by some of the warmest admirers of the Resolutions of '98.

That there is little probability of having such a law I am well aware. The adoption of specific duties on iron, even at their present amount, would at once cause a fall in the price of all iron in England of 30*s.* per ton, whereas a repeal of the duties on railroad iron would add 30*s.* to the present price. Supposing the whole difference to be even only 40*s.*, the difference to the British iron masters would be more than seven millions of pounds per annum, and in five years it would amount to little short of two hundred millions of dollars. Under such circumstances they could well afford to pay one, two, or even three millions of dollars for the repeal of the duty; and we have it on the authority of a member of the Senate, that "if the people had any idea of the dishonesty, corruption, and robbery practised at Washington, in all departments of the government, they would march to the Federal city and pitch the whole establishment into the Potomac." It is, however, so well known that large amounts of money have been paid for securing the passage of the various bills tending to the perfection of centralization in New York and Manchester, that it can scarcely be necessary to adduce proof of the fact. Individual members are said to have profited by railroad grants to the extent of fifty, sixty, and seventy thousand dollars, and when such has been the case in times past it would seem little likely that such a bill as this should fail to effect its passage. The few gentlemen concerned in one road would, as I am informed, profit by it to the extent of a million of dollars; and they alone could afford to pay $100,000. The legislation of this country is rapidly following the course of that of England, and passing under the control of Manchester and Birmingham, of which New York is the agent. Corruption and centralization always walk hand in hand with each other.

Iron has already advanced more than four pounds per ton; and as the whole power of Great Britain is now directed toward the extension of railroads in all parts of the world, while there is no corresponding increase in the arrange-

ments for the production of iron, I can see no reason to doubt that it may go to ten pounds, or even to twelve, if the duty be repealed. And yet every movement in Congress looks to compelling us to resort to *one market alone in which to make our purchases*, involving necessarily *a single market in which to make our sales*. Is it wonderful, then, that lands and lots around that market double in value while other lands and lots decline? Is it wonderful that New York, aided as she is by Manchester and Birmingham, should acquire power to *buy her way through Congress*, and thus dictate the whole legislation of the Union, while Virginia and South Carolina so rapidly decline in power? Will Virginia ever learn to "look to Virginia?"

Look, too, at the centralization of the direction of public opinion in the hands of the editors of a few New York papers, whose columns are controlled by the same men who purchase legislation and pay for it out of the taxes they impose on the West and the South. Is it wonderful that the purely agricultural portion of the country declines in power when its whole remaining energies are given toward centralizing in the hands of a body of traders the power to dictate the terms on which they will buy and those on which they will sell? Have not the farmer and the planter everywhere been poor when wholly dependent upon the trader? That they have is undeniable; and yet throughout this country they take their opinions almost alone from those journals whose editors realize fortunes from prohibiting all discussion on the question whether the loom and the anvil shall or shall not take their places by the side of the plough and the harrow.

Look next to the demoralization so obvious in that great city, whose government now expends annually three or four millions, all of it derived from the taxation imposed upon the farmers and planters of the Union, on objects that elsewhere would be provided for by a single million. Next look to the hideous mass of poverty and crime side by side with enormous luxury and gambling, and then look to the elections and reflect that the government of this whole nation is rapidly passing under the control of a *millionaire* aristocracy, and its squalid dependants.* Such has been everywhere the result of centralization.

Gold abounds and prices rise, but *not the price of raw produce*, the commodities that Virginia and Carolina desire to sell. The rise is confined to the things they need to buy, or to use. Cotton is cheaper than in 1846, but cotton cloth rises from week to week. Wheat is cheaper, but iron rises every day. Factory stock now rises from day to day, because the South has ceased to build mills; and furnaces rise in price because Ohio and Tennessee have nearly ceased to make iron. Centralization is giving to the North and East, cheap food and cotton with dear cloth and iron, and yet the South and West rejoice in the "benign" action of the tariff of 1846!

The commercial and political centralization now going on is, however, only the realization of the wishes of Mr. Walker, who desired to see New York "the great mart for the interchange of all the commodities of the earth," as London now is—that is, he would have all the Union go to that city with what they had to sell, there to meet all the world outside of the Union to make exchanges. Such an idea as this is in direct opposition to that of the commercial independence of the South. As much is it opposed to the independence and prosperity of its people, who find themselves every hour more and

* In 1850 the Chief of Police reported that there were in the city 18,456 persons occupying cellars, who had no other room.

more compelled to depend on the will of individuals abroad for the determination of the value of what they produce and what they desire to purchase.

Whenever we shall become sellers of cloth, iron and lead, your farmers will grow rich, and then they will be able to buy, and *pay for* large quantities of the fine cottons, the silks and other commodities produced abroad So long as we continue to be compelled to compete in foreign markets for the sale of a few millions of dollars worth of food, they must continue to impoverish their land and must remain poor. The difference between being buyers or sellers of raw materials is so fully illustrated by the wool trade of this country and Germany, that I am disposed to call to it your attention. Wool is higher here than in any country of Europe, because we have to import a small part of the quantity required for our domestic consumption; and such would be the case even were there no duty whatever payable on its importation. The wool-growers, therefore, grow rich, and they do so because the tariff of 1842 caused the building of a great number of woollen-mills, and enabled the manufacturers greatly to improve their modes of operation. Eight years ago, the case was different. The compromise tariff had for years stopped the building of mills, and the revenue tariff of 1840–42 had closed many of them, the consequence of which was that for several years our farmers were compelled to look abroad for a market for a small portion of their product. Then they had to take European prices *minus* the cost of exportation Now, they have European prices *plus* the cost of importation. Such, too, has been the case with Germany, *under protection*. Twenty years since, that country exported twenty-five millions of pounds of wool, and wool was cheap. Now she imports wool, and wool is high. Then she imported cloth, which was high. Now she exports cloth, which is supplied to her own people more cheaply than in, I believe, any country of the world. Such is precisely what would happen with us with regard to food, could we place ourselves in a position *to import one-half of one per cent.* of our consumption and to export cloth and iron, instead of *exporting one per cent.* of our crop and buying abroad our supplies of cloth and of iron. The difference of these two things to the farmers of the Union would not be covered by two hundred and fifty millions of dollars, and I am not quite certain that it would be covered by double that amount. In this you may, perhaps, think I am in error; and yet if you will examine carefully the facts you will, as I think, see that there are good reasons for believing that such is not the case. Look at the purely agricultural countries of the world, and see how poor are their people, and how weak are those nations. Then mark the fact that their people are the mere instruments in the hands of traders, who use them for their own profit. Look at Ireland, Turkey, Portugal, India, Brazil, and you will find abundant evidence of the correctness of this view; and then look at Virginia and the Carolinas, the most purely agricultural States of the Union, and see if such is not there the case. Next look at the countries in which their farmers are gradually interposing the artisan between themselves and the trader, and see if the people are not there steadily improving in their condition and the nations in strength. Take Russia, Northern Germany, Belgium and France, and you may even add Spain, since she has acquired some power to carry out her laws and repress the smuggling through Portugal and Gibraltar. She now converts into cloth nearly all her own wool, and now it is that she is enabled to import largely of cotton. She is gradually releasing herself from the dominion of Leeds and Manchester, and with each step in that direction she is acquiring the power of self-government. Next look at those parts of the

Union in which the farmers have combined their efforts with those of the artisan, and see how much more rapidly the people and the States acquire strength, and confidence in themselves. The South is constantly looking abroad for support—the North never. The South required Louisiana, Florida, and Texas, but the North has never sought to add a foot of territory to the Union; nor need she, *so long as the planter shall persist in weakening himself by insisting that he will not have the aid of the artisan in his contest with the trader.* It is the common idea through the South that the North is enriched by the spoils of the South, and that it is protection that enables it to be so; but if you will examine the matter carefully you will, I think, be satisfied that the disparity of strength, now so rapidly increasing, is due almost altogether to the fact that the South is the portion of the country which most needs protection against the power of "the merchant princes" of the world, and yet is the one that determines not to have it. Recollect, I beg of you, that it is not as the advocate of the manufacturers that I address you. For them alone I would not utter a word. They are but middlemen interposed between the producer of cotton and the consumer of cloth; and were their interests opposed to those of the producer and consumer I would say, let them take care of themselves. It is as the advocate of the farmer and the planter that I ask your attention to the facts I have laid before you, believing that nothing but calm consideration is needed for satisfying you that they are the people who really need protection, and who have most to gain by its being made effective.

Protection is either right or wrong. If right, the more effective it is made the better will it be for the nation, and the more speedily shall we reach perfect freedom of trade. If wrong, it should be at once and forever abandoned. Incidental protection is an absurdity; and yet we have gentlemen in Congress urging "the reduction of the duty on some few of the manufactured articles, that there may be a healthy competition with importations from abroad of similar manufactured articles." Now this is precisely what is desired by some of the larger ironmasters, because *it will tend to raise the prices of all the iron they have to sell.* They do not make railroad bars; and they know that if that description of iron be admitted free of duty, it will so raise the price of *all iron* in England, as to enable them to add six, eight, or ten dollars per ton to all their stoves, ploughs, and axes. Is this the course that the farmer and planter should desire to see pursued? It is not. They need that effective protection which will as speedily as possible terminate the importation of iron. Thereafter the price of all iron will be fixed by the cost of production among ourselves as the first step toward being themselves supplied so cheaply that we could export iron, as in 1846 we exported lead. This, however, is in direct opposition to the views of Mr. Walker, who told Congress that it was one of the objections to the protective policy that prices fell so rapidly that in a little time importation ceased, and the revenue suffered. We have here the strongest recommendation of protection brought forward as an argument against it. In 1846, there was no revenue from lead. Why? Because protection had made it so cheap that we exported it. Now we have a large revenue from it. Why? Because revenue duties have made it so dear that we import it. What we need is either real and efficient protection that will enable us to supply ourselves with cloth and iron, and speedily to become exporters of both, or real free trade, ridding ourselves of the absurdity of protection as merely incident to the raising of revenue, and it is time that the subject should be fully

examined with a view to the adoption of one or the other of them. We have now a large revenue, *derived from the power to purchase on credit.* So we had in 1836; but in 1842 we had scarcely any revenue because we had gone in debt so heavily that we had lost our credit. The revenue is now increasing, and it will continue to increase so long as our credit lasts; and the more you reduce the duties the more rapidly will the revenue grow, *because the foreign prices will grow faster than the duties are diminished.* Two years since a ton of bar iron paid $7 duty. Now it pays $15, and if we import, as we may, half a million of tons in the next year, this will make a difference of four millions of dollars. The prices of cottons, woollens, and other commodities, are gradually rising, *because we do not build mills;* and the more heavily the consumers of those articles are taxed by the foreign and the few domestic manufacturers that have escaped through the perils which surrounded them in the struggle that ended in the destruction of domestic competition, the larger will be the revenue; and the increase will all be paid by the farmers and planters, who will pay higher for their cloths, and their ploughs and axes, while getting far less for their wheat and cotton than they would be getting had they not annihilated that domestic competition, which was so rapidly carrying us forward toward becoming exporters of cloth and of iron, and importers of wheat.

So long as the South shall continue to insist upon the maintenance of a policy that forces us to be sellers of food, it must continue cheap and manufactures must continue dear. Whenever the South shall determine that the interests of the whole body of agriculturists of the Union will be promoted by the adoption of a policy that will enable us to become sellers of cotton and woollen cloths, and of iron, and purchasers of food, the former will be cheap and the latter will be dear. The farmers, mechanics, and labourers of the country will then be prosperous, and the domestic consumption of cotton will then become so large as greatly to diminish the necessity for forcing it into foreign markets; and their own direct trade with the consumers of cotton cloth throughout the world will so much diminish the cost of it to those consumers that the demand will exceed the supply, and thereafter they will be relieved from all necessity for holding conventions to determine how to keep up the prices of their own great staple, or how to maintain the dignity and honour of the Southern States. The secret for maintaining both is to be found in the establishment of that efficient protection, which will enable them to establish REAL FREE TRADE.

Has not the South become steadily weaker for the defence of its rights in its contest with the North; and is not this a necessary consequence of the exhaustion of its land, and the dispersion of its population? Is not the South now far, very far, weaker than it would have been had Texas and California remained out of the Union; and have not the addition of those States, and the dispersion of the population, north and south, added enormously to the growth of centralization? For an answer to this question, let me ask you to look to the fact that a large proportion of the grants of land and money for which Congress has been, and is now, importuned, and for obtaining which large prices have been and are now being offered, have their origin in this extension of territory—the act of the South—and that the profit of nearly all these grants centres in New York. Next let me ask you to look to the fact that the enormous increase of public expenditure has its origin in this increase of territory; and that the profit of that expenditure goes to the increase of the revenues of the owners of lots and lands in New York; and

that the South is thus daily building up a power that may be regarded as only a branch of that great central one by which it is taught that Christianity is to be benefited by the destruction of Southern interests. "The price of a negro on Red River," says one of the latest English writers, "varies with the price of cotton in Liverpool; and *whatever tends to lower the value of the staple here not only confers an inestimable advantage on our own manufacturing population, but renders slave labour not only less profitable, but therefore less permanent, in Alabama.*" It is certainly fortunate for England that she has found a mode of enabling philanthropy and pecuniary profit to travel in company; but how is it that the Alabama planter goes to such men for advice how to enrich himself, and thus enable him to defend his rights of property?

Must not the South continue to grow weak if the present policy be continued? To me, such a result appears inevitable. The more you disperse your population the more you must need roads, and the cheaper must be the wheat and the cotton with which to buy the iron and the cloth, and the higher must be the cloth and the iron with which to pay for the wheat and the cotton; and the more you must be compelled to resort to brokers in Wall street, and in London, for the sale of bonds, thus rendering yourselves from day to day more dependent upon those whose interests are directly opposed to your own. They desire to have iron dear and cotton cheap, and you place yourselves more in their power from day to day. Mr. Walker certainly did not mean to promote the weakening of the South, but had he done so he could have desired no better mode of action than that of a system of *ad valorem* duties that would destroy the domestic competition for the sale of cloth and iron that was so rapidly growing under the tariff of 1842.

At the moment of concluding this paper I received the proceedings of a meeting held in Baltimore, at which were delivered various speeches referring to the necessity of the South and West endeavouring to prevent the further concentration of the commercial capital of the nation at New York; and thus make all sections of the country equally attractive. Nevertheless, of all those present there were few who were not advocates of that system of policy which tends to cheapen food and cotton and to render cloth and iron scarce and dear, by centralizing the whole trade of the Union in New York, as the only medium of communication between the men who eat food and spin cotton while making cloth and iron. Twenty years since a similar effort was made for Norfolk, and what has been the result? Has her trade grown? Will it, or will that of Baltimore, or of Savannah, grow, under a system that tends daily to weaken and impoverish the South, and to render it more dependant on the North and the East—on New England and old England? It is impossible; and the only consequences that will result from such meetings will be that twenty years hence the South will look back to the late convention as it now does to that held twenty years since, and be surprised to find that its "commercial subserviency to Northern cities" has augmented in a geometrical ratio in the whole period that has elapsed. To free itself from that "subserviency" the South must fit itself for direct trade with the world, and *that it will never do until it determines to take for itself efficient protection.*

I am very respectfully,

Your obedient servant,

HENRY C. CAREY.

*Burlington, December* 24, 1852.

# FLORICULTURE.

## CULTURE OF THE ROSE.—NUMBER ONE.

PERHAPS, of all the flowers that adorn our greenhouses, our borders, or our gardens, none are more beautiful and attractive, or more worthy attention in regard to its culture and propagation, than the rose. The varieties that are being continually added to it, and its universal adoption as a leading ornament in almost every garden, warrant us in preparing a few short articles in regard to the culture, peculiarities and properties of some of the most admired varieties of this beautiful flower. And here we would remark, that probably out of one thousand varieties which are named in some of our larger catalogues, eight and perhaps nine hundred might be dispensed with, unless they are propagated merely for the sake of curiosity to grow an entire collection; but our purpose in the present chapter being to assist the amateur at the beginning of his efforts, we will give a few of the best tests and some of the most reliable rules for selecting the good from the bad.

To define, however, the properties of a fine rose, is attended with considerable difficulty, arising from the following curious facts: First, the rose is the only flower that is beautiful in all its stages, from the instant the calyx bursts and shows a streak of the corolla till it is in full bloom; secondly, it is the only flower that is really rich in its confusion, or that is not the less elegant for the total absence of all uniformity and order. The very fact of its being beautiful from the moment the calyx bursts, makes the single and semi-double roses, up to a certain stage, as good as the perfectly double ones are; and there is yet another point in the construction of some varieties, which makes them lose their beauty when they are full-blown. For instance, the Moss-rose is a magnificent object so long as the calyx is all seen, but so soon as the flower fully expands, all the distinction between a Moss-rose and a common one has departed, or is concealed. From this one fact, it is evident that roses, even for show, must be divided into distinct families, and those qualities for which families are most distinguished must be exhibited to the best advantage. The grand characteristic of a Moss-rose is its calyx, and therefore all varieties of Moss must be exhibited before they expand enough to hide the calyx. In the present state of horticulture, we can hardly allow that any other description of rose should be grown if semi-double. Some, however, consider that a climbing-rose, or a rose of peculiar habit, or indeed any other distinction, should be sufficient to justify semi-double and imperfect flowers. If we concede any thing, the extent should be, that a *new color* only should justify the saving of any semi-double or single rose; and we are very much mistaken if any who have been accustomed to grow the best double roses, would give much for any variety of the former description.

If there be any distinct and valuable feature *in a plant*, which justifies the growing of a variety for its beauty *as a plant*, the bloom is at once out of the question, and we hardly take such a variety to be worth the florist's keeping. There are, however, some properties which apply to all roses, whatever be their characteristics in other respects, and therefore must be taken as an estimable point in the construction of a flower.

1. "The petals should be thick, broad, and smooth at the edges."

Whether this be for a Moss, which is never to be shown fully opened, or

the florist's favorite, which is to be shown as a dahlia, this property is equally valuable, because the thicker the petal, the longer it is opening, and the longer does it continue in perfection when it is opened. There is another essential point gained in thick-petalled flowers: The thicker the petal the more dense and decided the shade or color, or the more pure a white, while the most brilliant scarlet would look tame and watery if the petal were thin, transparent, and flimsy. Hence, many semi-double varieties, with these petals, look bright enough while the petals are crowded in the bud, but are watery and tame when opened and dependent on their single thickness.

2. "The flower should be highly perfumed, or, as it is termed by dealers, '*fragrant.*'"

Whether it is to climb a cottage, bloom on the ground, or mount a trellis, or other device, fragrance is one of the great charms which give the rose its distinguished preëminence as the queen of flowers.

3. "The flower should be double to the centre, high on the crown, round in the outline, and regular in the disposition of the petals."

DIAGRAM OF A FINE DOUBLE ROSE.

In remarking on the present classification of roses, we will in the first describe the

Provence Rose.—This, or what it is frequently called the Hundred-leaved rose, is a distinguishing title to every rose that has a remarkably double flower, unless there is something in the habit or character that causes for it another title. If this were understood, we should know what we were about. The Moss-rose would clearly come under this, were it not for the moss; for the old Cabbage-rose and the Moss-rose strongly grown would not be known

from each other except for the moss; and Moss-rose would be a Moss-rose, if ever so single, though its original were double and fine. Now, the Provences of which the old Cabbage-rose is a sort of type, and generally called the Hundred-leaved rose, ceases to deserve this if semi-double. So that, although the origin of the family is rightly named, many that are pushed into the same list do not deserve the name.

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## ILLUSTRATIONS OF POPULAR MACHINERY.

It has often been repeated, that there is a real confederacy between civilization and machinery. Civilization is the fruit of machinery, which diminishes toil and facilitates and lessens labor without superseding it. It enables men to perform what they could not accomplish without such aid. What seems wanted at this era is some master-spirit to arise, to accomplish for the history of science and morality what Gibbon did for Rome, or Audubon did for ornithology. Such a master-mind might comprehensively display the true causes of the fact that since the introduction of self-acting tools, and the classification of labor, men are often becoming tools themselves; and how the use of machines as substitutes, formerly requiring skilful working men, at present *appears* to have the effect of increasing wealth in a few hands. Such a master-mind, by industrious research, patient investigation, critical acumen, and shrewd penetration, would be worthily employed on so grand a theme as "The History and the Progress of Machinery, and the method by which it will ultimately modify the unequal distribution of comforts, and man's ultimate disenthralment from vice, poverty, and degradation." When such a work is accomplished, with the poet we may exclaim:

> "Then shall the reign of mind commence on earth,
> And starting fresh as from a second birth,
> Man in the sunshine of the world's new spring
> Shall walk triumphant like some holy thing."

It has been tritely enough shown by many writers, that if man were furnished with no other means of defense, or assistance to his physical strength, than those which his own organization supply, he would be the most helpless of existing creatures. But his hand instinctively grasps the stick or stone as protective weapons, while hunger teaches him to form the bow, the spear, &c., for the pursuit of game or fish. He twists the vegetable fibre into the line or the cord, and the cord into the rope. From fallen trees he makes the raft or canoe. He quits the cave and builds the hut; but in doing so finds he has to do with materials beyond his unaided strength to fashion or to move. The pole in his hands becomes a lever to remove the trunk of the fallen tree, and the rope of twisted fibres or thongs, thrown over the fork of an extended branch, probably formed the first crane. By this arrangement several men could unite their strength, and one man hold fast the result of their combined labor. It has been suggested that the origin of the crane machine, and the name, is derived from seeing that long-necked fowl wading in the shallows by a river side, and plunging its bill into deeper pools to bring up its food. Most readers are aware that the present method, in many parts of this country, of raising water from a well, is by means of a tall poplar or other tree, resting in the fork of an elm or oak growing near the well or brook. The root end of the poplar, assisted often by the weight of a stone, overbalances the top

from which the bucket is suspended, the counterbalance being equal to half the weight to be raised, so that the person has to pull down the bucket to make it descend into the well, the counterbalance assisting to hoist up the bucket when full, and thus, by apportioning his efforts, doubles them in the time of need.

The application of the pole as a lever for moving weights, or for turning over the trunk of a tree, might suggest its further use, combined with a rope to obtain mechanical power; as is sometimes adopted by our backwoodsmen, and in Canada, for the purpose of hoisting timber. They attach a lever and axle to three legs formed of three poles, secured by a rope and shackle at top. The end of one handspike or spoke, being occasionally thrust through the axle or windlass, rests upon the ground and stops it from unwinding, forming a simple but effective check. A similar primitive windlass is still used by the Chinese for weighing anchor, even in their largest junks. So late as the beginning of the present century, the windlass used on board of the best British and American vessels was but little advanced on that of the Chinese. The difference consisted mainly in its not extending entirely across the vessel, as that of the Chinese, but was supported and secured by two strong timbers fixed on opposite sides of the main deck, a little behind the foremast, wherein the windlass turned on its axis. These were called "windlass bits," and made in two pieces for more convenience in getting out the windlass and allowing the bight of the cable to be passed around it, commonly in three turns; the upper parts of these bits, being formerly ornamented with carved "knights' heads," still retain that name. Another difference consisted in the windlass being furnished with "pauls," which Falconer, the author of the poem called the "Shipwreck," thus describes:

"The pauls, which are formed of wood or iron, fall into notches cut in the surface of the windlass, and lined with plates of iron. Each of the pauls being accordingly hung over a particular part of the windlass, falls eight times into the notches at every revolution of the machine, because there are eight notches placed on its circumference under the pauls. So, if the windlass is twenty inches in diameter, and purchases five feet of the cable at every revolution, it will be prevented from turning back, or losing any part thereof, at every seven inches, nearly, which is heaved in upon its surface."

"As this machine is heaved about in a vertical direction, it is evident that the efforts of an equal number of men acting upon it will be much more powerful than on the capstan, because their whole weight and strength are applied more readily to the end of the levers employed to turn it about; whereas, in the horizontal movement of the capstan, the exertion of their force is considerably diminished. It requires, however, some dexterity and address to manage the handspike to the greatest advantage; and to perform this, the sailors must all rise at once upon the windlass, and fixing their bars therein, give a sudden jerk at the same instant, in which movement they are regulated by a sort of song or howl pronounced by one of their number."

Many improvements have successively been made in the windlass. Machinery of various kinds has been attached to it to render its working nearly continuous, more rapid in its action, and also useful for lighter work, such as warping ships out of harbor, &c.

Large vessels now use, instead of the windlass, the capstan, which allows a number of men to act together by walking round it in a united effort, to the sound of music or a song. It is composed of several parts, namely, the "drum-head," the "barrel," the "whelps," and the "spindle," all made of timber. Our readers can best understand the working of this machine by

stepping on board a large ship. Referring to the practice of heaving the capstan to the sound of music, it may be mentioned that the Russians of the present day employ them in moving immense blocks of stone; and also employ them in moving their line-of-battle ships, often built on shallow water at a distance from the sea, until they are fairly floated upon the caissons which are used to buoy them up and enable them to come down the Neva to the Gulf of Finland, towed by a flotilla of row-boats. The rock on which stands the colossal statue of Peter the Great was moved from Lachta, in Finland, to the Russian capital by the aid of many capstans worked at the same time by a large body of soldiers, who kept step to the sound of the drum. The transit of this enormous block of granite was facilitated by a kind of anti-friction railway, laid down as it proceeded onward and taken up from behind; it consisted of large beams of timber, wherein grooves were formed to receive large cannon balls, the stone resting upon corresponding grooved timbers, so that the two beams formed a kind of channel for the balls.

The capstan was formerly used at the mouths of coal mines in England; but as the mines became deeper, frightful accidents often occurred through the miners not acting in concert, and being occasionally overcome by the descending load, flinging the miners from its arms with fearful and fatal violence. It is generally superseded by "the gin," which is worked by horses or steam. The gin consists of an upright wooden axle, on which is fixed a hollow cylinder of woodwork called the cage, round which a rope winds horizontally, the ends of the rope being directed down the pit by two pulleys. A transverse beam, eight yards long, is secured across the axle, to each end of which is yoked a horse. The horse track is not less than eight yards in diameter, so that the animal does not expend his force in an oblique direction, but gets a fair pull. Lately, the steam engine has in most cases superseded the horse gin for winding up coals, and similar uses. These machines, as our readers will perceive, are but modifications of the wheel and axle.

[TO BE CONTINUED.]

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## CULTURE OF BEETS.

Mr. James Reeve, an extensive English farmer, of thirty years' practice, has published an account of his mode of cultivating this important crop. His views differ from those of most farmers, as he supposes, but he has confidence in the results of his own observations. His mode is, to enrich only with the tops of the beet, which he ploughs in, in a green state, leaving them to a natural decomposition. He contends that this is one of those crops which, like a forest, are able to sustain themselves by their own annual products. This may be true; "science," so called, is sometimes sadly at fault, in these matters. The soil of a forest is constantly growing more and more fertile. True, crops are not plucked up and carried away, as with those which we harvest, but the annual growths of woods are not returned to the soil, nor can they possibly tend in any manner to enrich it. The leaves only are "deciduous," alone "return to dust," while the trunk of a single oak or pine is increased annually perhaps by a ton. Our only explanation is that, with a virgin soil at the beginning, the tree can appropriate from the air and from water, the elements not contained in the decayed leaf. Every crop is best nourished by the decomposed

products of its own growth. But this writer must speak for himself. He says:

I have in several valuations, this present season, taken accounts—heavy accounts—paid for manures used in the preparation and growth of these crops. In some instances, besides the ordinary dressing of ten or twelve loads of the common yard manure, a considerable quantity of super-phosphate of lime, sulphate of ammonia, pearl-ash, soda-ash, sulphate of magnesia, calcined bone-dust, muriate of ammonia, &c., and various other mixtures have been employed. In viewing these crops I could not but remark the very great unhealthiness of their appearance; and it has occurred to me, in making a comparison with my own crops, that it is extremely doubtful whether the various manures used for the culture are suitable for the best product; on the contrary, I am more inclined to believe that many of the manures are extremely prejudicial to those plants, and tend to check the free circulation of the absorbing powers. In one instance I was thoroughly satisfied, when valuing a crop of roots, that they were in a most unhealthy condition; especially the leaves. These were spotted and deformed; in some instances yellow and lifeless, even to the hearts of them. This will at once account for the deformed and irregular state of the bulbs, for as soon as the absorbing powers of the plant are injured, the constitution of the whole is immediately impaired; and there is no remedy to restore them to health when once their vitality is affected. I consider this very succulent and susceptible foliage was injured by the evaporation of the manure used for their growth; for although the air and support enter every part of the plant, the chief admission (with the beet tribe) is through the leaves. The leaves of the beet are perhaps more succulent than those of any other plant in cultivation. Air-vessels are found in the leaves of all vegetables, but in the beet family they are more readily discovered; and there is no doubt that air is inhaled by vegetables, and adds abundantly to their substance, for it supplies the properties most suitable for the plant. I have no hesitation in saying that it will soon be proved by analysis that the atmospheric air and the attracting powers of the plant, in combination, effect the formation of these bodies. The great aërial principal is of the utmost service to plants at all times and of all kinds; but for these in particular it has almost every requisite in itself for their perfection. Beet has so succulent a leaf that it may draw a great part of its nourishment from the air; and no doubt can exist (from practical knowledge) that there are many properties in the nourishment suitable for the beet class which contribute to their growth and produce: but the air contains most of them, and is the principal food for the beet.

Beet is considered by many an exhausting crop; but it is not so if its principal food is supplied by atmospheric agency, and by ploughing into the ground the immense quantity of leaves, containing the natural food for future absorption; thus return into the earth much, very much of the natural ingredients and properties of the plant.

From the action of this principle it may be deduced that in every three or four years, whatever the course of system may be for fallow, for rest, or otherwise, a good crop of either beet or mangold wurtzel may be produced without the formidable outlay which has hitherto proved so discouraging in the culture of these valuable crops.

The beet may be considered an attractor to the various atmospheric agencies, as may be verified by its chemical contents. Manure may be applied to whatever crop you desire; but for a fine healthy crop of beet or mangold wurtzel, unincumbered by a quantity of forks and fibres, it is best to

leave the chemical productions of the earth and atmosphere to form its chief feeding and nourishment; and although I believe the third or fourth course system as that which would take in a proportionable part of a farm annually for this product, I have little doubt that by constantly burying the leaves in the earth a fair crop of beet or mangold wurtzel would be produced alternately on the same land. Some situations, some aspects, some counties may be more or less favorable, and the productions of the chemical properties may vary; still my plan would be the same.

In confirmation of the foregoing observations, I may be permitted to offer the experience of upwards of twenty-five years in the cultivation of beet and mangold wurtzel, during which time I have had the advantage of obtaining the opinions of the most competent judges on the produce of my crops. I will further illustrate this efficacious mode of culture by the produce of this present season, 1851, which is considered (throughout England) to have been more unsuitable for the culture of bulbs than any period within the last ten years. The following table will exhibit the produce of four kinds grown this season; viz., White Silesian Beet, Orange Globe, Rose Pink, and mangold wurtzel:

| | | Tons. | cwt. | lbs. |
|---|---|---|---|---|
| White Silesian, - - - - | per acre, | 38 | 17 | 96 |
| Orange Globe, - - - - | " | 32 | 18 | 16 |
| Rose Pink, - - - - - | " | 31 | 10 | 9 |
| Mangold wurtzel, - - - | " | 39 | 13 | 6 |

I will here copy, from my book of valuations taken this season, (Michaelmas,) the cost of preparation of five acres of these roots situated within two miles of my farm:

A FALLOW—FIVE ACRES.

Four times ploughed, twice scarified, twice drag-harrowed, twice small-harrowed, two rollings, drilling, forty-six loads of yard manure, twenty-two hundred-weight of salt, six hundred-weight of super-phosphate, two hundred and ninety bushels of ashes, carting, spreading, five hoeings, rent, taxes, &c.

I have other valuations which I could cite, where guano and the other more expensive dressings are used; but I must leave this part of the present system of culture, which is already notorious for its expensiveness. I may here repeat:—Use whatever manure you please for other crops, but none for the beet; and I will now offer some additional proofs to the foregoing observations relative to my crops this season.

The land in question, when I grew the present roots, had been cultivated in the following rotation—wheat, peas, turnips, (fed off,) oats, and the last crop beans, (1850,) each year having produced most abundantly. Now it may be supposed from this process that the land never requires cleaning, &c. I acknowledge that it requires both restoring and cleaning; and I at once have recourse to my favorite plan in order to restore it to its good keeping. I have it once ploughed deep in March, harrowed and rolled; and about the last week in April I drill in the seeds, about two feet apart in the rows. In this present month (November) I have the roots taken up and the leaves trimmed off, leaving about three and a half tons per acre dispersed evenly over the ground. I then have them immediately ploughed in, and the wheat drilled, leaving the field perfectly clean, with no other dressing than the vegetable matter for my wheat crop; and by this process I find that I obtain the finest crops of wheat on my farm; besides, from the frequent hoeings, the land is perfectly clean and in fine working order. Though the land on this

estate varies considerably, having both light and stiff loam, gravel and clay, my plan is the same. After the present crop (wheat) I take a crop of clover, dress the ley for my second and third crop, and again grow beet or mangold wurtzel to clean the land for the wheat. It will be observed that I have named a third crop: this would be in proportion to my land; but if I required to grow these crops more frequently on the same land, I would undertake (without the smallest hesitation) to have a fine produce every alternate crop.

I have at present one field under this course. It was beans last season, and required cleaning and improving, having produced four crops since it had been manured. It was foul, as may be supposed, but is now perfectly clean, and drilled with wheat, with no other dressing; and I know from experience that I have a safe prospect of a fine crop.

The great question, and I may say the only question now unanswered, is, "Do these roots, without manure, contain the same amount of saccharine matter as when freely manured?" It is said that the action of manure of every description has an important influence on the quality and amount of sugar; and although no positive experiments have ever been carried out to test the nature of such influence, a great deal of misconception appears to prevail upon the subject. I think most of the fears entertained on this point are groundless, especially (as Professor Sullivan says) when we recollect that several of the bulbs which he examined were grown on land highly manured. Now, whether the amount of substance is increased, and the saccharine juice improved, is still a question, so far as it relates to the ingredients suitable for making sugar, or even for producing the best results as a means for feeding stock; and, as the Professor remarks, 'if animal manures cannot be employed, from fear of diminishing the amount of sugar, the profit of the farm will be diminished.' Nitrate of potash has been found at some periods in the juice of beet-root; and it appears that as this substance increases the amount of sugar dimishes; and in some cases (observed by Peligot) disappears altogether. In confirmation of this, I will cite a case which occurred a few years ago on the estate of a Russian nobleman, Count Basil Brobrensky, who possesses a very extensive establishment, in the government of Toula, for the making of beet-root sugar. In the year 1846, the director of the works was surprised to find, when the sugar was taken from the moulds, that the greater part was almost completely changed into saltpetre, little more than 35 per cent. of saccharine matter remaining; in fact, some portions of the substance ignited more freely than, and burnt almost as fiercely as saltpetre, from the remaining parts becoming charred. The gentleman who is my authority (a resident of twenty years in Russia) ignited some of the particles himself, and can vouch for the accuracy of the statement. After a careful investigation, the inference was that the excess of nitre was owing to the land having been too freely manured. It seems that these consequences, resulting from manure, frequently occur; for this gentleman assures me that in some instances, when the sugar is tolerably free from nitre, the treacle (molasses) is so impregnated with it that it has been rendered unsaleable, being offered at £2 10s. per ton without meeting with a purchaser; so that it was afterwards used as a top-dressing for grain. From this it seems extremely doubtful whether high manuring, or even the liberal use of manure, is calculated to promote the best produce. If, therefore, such doubts exist as to high manuring for the family of beet, it is unnecessary for me to urge further the advantage of the system I have recommended. So simple and easy are the means, and so completely within the reach of every small farmer, that I hope many will try this method; and

I am convinced that they will be induced every season to have a portion of their farm, let it be ever so small, cropped with beet or mangold wurtzel.

Many who attempt to grow beet, leave the plants too close to each other, which is objectionable in many respects, particularly for the hoeing and cleaning. Let it be for a moment considered that if planted two feet apart there will be a produce on the surface acre of 10,890 plants; that is, both two feet apart longitudinally and latitudinally, or lengthways and breadthways.

The white Silesian beet is incomparably the best for the manufacture of sugar; and the circumstance of its containing more saccharine juice than the other kinds at once proves the advantage of its culture for feeding purposes. Complaints have been made of its having its roots too much forked and too fibrous: this will not be the case if manure is not immediately applied to encourage these objections.

My views as to the inutility, and even injurious effect of manuring the ground for beet crops, as especially detrimental to the production of the saccharine matter, receives further a remarkable and very timely support from a communication lately made by a gentleman conducting the beet-sugar manufactory now in process at Mount Mellick, in Ireland, (King's Co.,) by which the quantity of saccharine in the roots examined appears to be in direct inverse proportion to the degree of preparation or manuring which the land had received. He states:

"I caused a root to be scraped, and on examining the product with a Beaume's hydrometer, I found the density of the juice to be 8 deg., thus indicating that a gallon of the juice of this quality would yield one pound of sugar. The gallon of juice would weigh but little more than 8 lbs., and from this I infer that the root contained not much below 12 per cent. of sweet constituent, which, allowing for molasses and waste, may be equivalent to about 10 per cent of crystalline sugar. I have made a great many trials of beets from various localities. The specific gravity of the juice I find ranges to 7¾, 8, and 8½ deg. (the latter is from Lord de Vesci's.) One specimen of the white Silesian, a very large root grown at Mount Mellick in a garden which was highly manured, only indicated 5½ deg., proving that high culture *produces leaf, and diminishes the saccharine qualities.*"

Some farmers in my neighborhood sell a part of their crop of beet or mangold wurtzel, which is frequently as high as 20s. per ton; but probably a farmer would not on a large quantity realize this price. Well, let us value it at 10s. per ton for his various consuming purposes, (I think it worth much more;) this would pay him twice the value of an acre of wheat.

Although many advantages may be gained by repeated ploughing, and turning over, and breaking the particles of earth for the produce of most plants, yet it is not so with the best culture of the beet or mangold wurtzel, and the prevention of the evaporation from the soil is desirable for the accumulation of the suitable and natural ingredients. From so much of the atmospheric air being blended with the soil, a large portion of the oxygen may be supplied and retained; and this, with the union of carbon and various other inflammable materials which the earth contains, would probably produce the carbonic or other acids requisite in greater abundance, and more suitably for the growth of the beet. Frequent hoeings also would bring it more minutely in contact with the portions of atmospheric air, and unite with it what has been covered in and pent up previously; and thus the supplies of ammonia, or volatile alkali, with the combination of its hydrogen with azote, would be more regular and more copious, as well as those of nitre, by the complete

union of its superabundant oxygen, with some other portion of abounding nitrogen or azote of such air.

As the atmospheric air consists of oxygen and other fluid matters of heat, and these combined form the material, and produce the nitrous acid, or the oxygen in its fluid state, which is of great utility in promoting the growth of plants; and further, if any process of the putrefactive kind be going on where atmospheric air is in this way confined in the soil, the azote may combine with the hydrogen of the decomposing water, or contribute to decompose it, and after this has been completed is of very material use in promoting vegetation; while at the same time, the oxygen afforded by the decomposing water may, like that of the atmosphere, contribute to the production of carbonic, nitrous, or phosphoric acids, and in this way will render the compound a basis quite capable of being taken in by the absorbing plants. Thus, by the course of nature, there is a production of both ammonia and nitrous acid, which are so suitable for the best beet-root family, and so beneficial in promoting vegetation. It is then readily to be conceived that the process of fallowing land for the production of the beet-root or mangold wurtzel, may cause some danger, by the natural ingredients being injured by too much evaporation and exposure; so that however plausible it may be to fallow land, (and it would be difficult to persuade many people that it is not desirable,) it may, as well as the use of manures, for the production of the roots, be essentially wrong, and tend to destroy the natural elements of the earth and air productions, and check the union of such substances as form the compounds already alluded to.

It has been said by some writers, there may be other products of not less consequence arising from dissipation or loss of the carbonic or nitrous acids; so that although there may be much advantage in ploughing frequently to promote the best produce, in most crops it appears, from the success I have had at all times with my crops of beet-root, that the great mechanical alterations which must of necessity take place in the soil by repeated ploughing, and from the exposure of these compounds to the influence of the atmosphere, can in no way promote the improved production of the roots. Let it then be strenuously contended that the most judicious intermixture of crops upon every kind of soil, will not preclude the necessity of a summer fallow. I doubt it very much; for I contend, from long experience, that a well-managed crop of beet-root or mangold wurtzel will clean the foulest land, and help to restore it to its required condition. But whatever advantage there may be in fallowing, and obtaining a perfect pulverization in this mode of cleanliness, it is a mistake to imagine it requisite to incur these heavy expenses to produce a fine crop of beet. Besides, the process of fallowing is almost destructive to the vital economy of nature in these plants. The loss sustained by the land remaining idle such a great length of time by the prevailing system of fallow, cannot be disputed; why not, then, lessen the expense by a suitable and more profitable substitute—a substitute which will insure a still more luxuriant crop the following season, obtained by cleanliness and an ample supply of vegetable matter, the leaves being ploughed into the ground, in preference to their adoption for any other use hitherto sanctioned in rural economy?

We thus insure, then, the fact that beet-roots may be grown every season in the same piece of land; the foliage of the produce of one season being a natural nourishment for the plant the following season; and to facilitate this process, I would suggest that trenches be dug out between the rows of plants, and when the crop is taken up and trimmed, to bury the leaves in the trenches and fill them up with earth—these trenches to be considered the line for the

succeeding crop—thus offering an abundant supply of the food and properties necessary for the next produce.

From all the information I can collect, plants grown without the assistance of any kind of manure contain as much, and in many instances more saccharine matter, than those to which such artificial means have been supplied, and which consequently would be grown only at a much greater expense.

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## MACHINES—TOOLS—NEEDLES.

The difference between a tool and a machine seems not to be very clearly defined, even by those who use both. A popular explanation of them may be useful. A machine is generally considered as an organ or instrument placed between the workman and the source of power or force, whatever that may be, and the work to be done. Machines are used chiefly for three reasons: To accommodate the direction of the moving force to that of the resistance to be overcome; to render a power, which has a fixed and certain velocity, effective in performing work with a different velocity; to make a moving power, with a certain intensity, capable of balancing or overcoming a resistance of a greater intensity. These objects, as all who have studied mechanics know, may be accomplished in different ways; either by using machines which have motion round some fixed point, as the three first mechanic powers, the lever, the wheel and axle, and the pulley; or by those which furnish to the resistance to be moved a solid path along which it may be impelled, as is the case with the inclined plane, the wedge, and the screw.

Various operations occur in the arts, in which the assistance of an additional hand would be a great convenience to the workman; and in these cases tools of the simplest construction come to his aid. A tool, therefore, may be called the first element of a machine; and simple machines are often only one or more tools placed in a frame, and *acted on* by any moving power. An illustration of the advantages of tools is at our hand.

Most readers know something of the manufacture of needles: how the best steel is reduced by wire-drawing machines to a suitable diameter; how the steel wire is calibred, by means of a gauge, to an equal thickness; how it is then cut into the desired needle-lengths; how the wires are taken to the grindstones to be sharpened, the heads hardened, the eyes pierced, grooved, and thrown pell-mell to the temperer, and afterwards polished. Now some twenty or thirty thousand needles are thrown promiscuously into a box, mixed and entangled with each other in every possible direction, and have to be arranged in such a form that they shall be all parallel one with another. This would be a tedious and difficult operation if each needle were to be separated individually, yet this operation is daily performed in needle manufactories in an incredibly short space of time by a very simple *tool*. This tool is nothing but a small flat tray of sheet iron, slightly concave at the bottom. The needles are placed in it, and shaken in a peculiar manner by throwing them up a very little, and giving at the same time a slight longitudinal motion to the tray. The shape of the needles assists their arrangement, for they will, when they fall on the bottom of the tray, tend to place themselves side by side, and the hollow form of the tray assists this disposition. As they have no projection on any part to impede this tendency or to entangle each other, they are, by continually shaking, arranged lengthwise in three or four minutes. The direction of the shake is now changed: the needles are but little thrown up,

but the tray is shaken edgewise; the result is that the needles, which were previously arranged endwise, become heaped up in a wall, with the ends against the extremity of the tray. They are now removed by hundreds at a time, by raising them with a broad spatula, on which they are retained by the forefinger of the left hand. During the progress of the needles towards their finished state, this parallel arrangement must be repeated several times; and unless this cheap and expeditious method of handling this tray, or *tool*, had been devised, the expense of manufacturing needles had been considerably increased.

Another process in the art of needle-making furnishes an example of one of the simplest contrivances which come under the denomination of a *tool*, the efficiency of which will appear. After the needles have been arranged in the manner already described, it is necessary to separate them into two parcels, in order that their points may be placed in one direction. This work is generally performed by children. The needles are placed sideways in a heap, on a table, in front of each operator, just as they are arranged by the process already described. From five to ten are rolled towards this person by the forefinger of the left hand; this separates them in a very small space from each other, and each in its turn is pushed lengthwise to the right or to the left, according as its eye is on the right or left hand. This is the usual process, and in it every needle passes individually under the finger of the operator. A small alteration expedites this process. The child puts on the fore-finger of its right hand a small cloth finger-stall, and rolling out of the heap from six to twelve needles, he keeps them down by the fore-finger of the left hand gently against their ends. Those needles which have the points toward the right hand sink into the finger-stall, and the child, removing the finger of the left hand, slightly raises the needles sticking into the cloth, and then pushes them towards the left side. Those needles which had their eyes on the right hand do not stick into the finger-cover, and are pushed away to the heap on the right side previously to the repetition of this process. By means of this simple but ingeniously contrived *tool*, each movement of the finger from one side to another carries five or six needles to their proper heap; whereas, in the former method, frequently only one was moved, and rarely more than two or three were transported at one movement to the proper place.

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FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

## ANALYSIS OF CLAM AND OYSTER SHELLS.

Messrs. Editors:—In your January number of the "*Plough, Loom and Anvil*," is a brief notice of the application of oyster shells as a manure for fruit trees. That those who use them may know what they are adding to their soil when they apply them, I here send you for publication their analysis, together with the analysis of the clam shell.

In the vicinity of the sea-coast and in the neighborhood of large towns, the common clam and oyster shells are quite extensively used by farmers as a manure. They are sometimes thrown upon the land whole, sometimes previously broken into fragments, and often burned. As a general rule, the latter method may be considered preferable to either of the others.

Soils, however, containing already a sufficient quantity of lime for present demands, and where the object is merely to compensate for the gradual waste, shells unburned may answer quite as good a purpose as those which have

been burned. When used before burning, owing to their compact texture, they are acted upon but slowly by the ordinary agents to which they are subjected, and hence it requires a much larger quantity of them than of burned shells to exert, in a given time, the same degree of influence upon the soil. Unburned, their effects are not materially different—throwing aside the small quantity of animal matter and soluble salts they contain—from ordinary limestones broken equally fine and disposed of in a similar manner.

Before burning—omitting the moisture—they are made up principally of carbonates, with a small quantity of organic matter, phosphates, sulphates, and chlorides. The process of burning expels nearly all of the carbonic acid and organic matter, with some of the chlorine, leaving the phosphates, sulphates, and a small amount of chlorides and carbonates. The rest, lime, which makes up nearly the whole, is in a caustic state.

As the composition of these shells, both before and after burning, may be of some interest, I here give them:

The common *clam shell* (Venus mercenaria)—100 parts of the dry unburned shell gave of

| | |
|---|---|
| Silicia, | none |
| Phosphates of iron, lime, and magnesia, | 1.250 |
| Carbonate of lime, | 69.204 |
| Sulphate of lime, | 0.815 |
| Lime, probably combined with organic matter, | 13.907 |
| Magnesia, | 1.400 |
| Potassa, | 1.847 |
| Chloride of sodium, | 6.101 |
| Organic matter, | 6.050 |
| | 100.614 |

The same shell, burned till the organic matter and carbonic acid were nearly all expelled—100 parts gave of

| | |
|---|---|
| Silicia, | none |
| Phosphates of iron, lime, and magnesia, | 1.856 |
| Lime, | 78.610 |
| Sulphate of lime, | 1.210 |
| Magnesia, | 2.078 |
| Potassa, | 2.816 |
| Soda and chloride of sodium, | 10.386 |
| Carbonic acid, | 3.043 |
| Organic matter, | trace |
| | 99.999 |

Shell of the common oyster (Ostrea borealis)—100 parts of the fresh shell, deprived of water, gave of

| | |
|---|---|
| Phosphates of iron, lime, and magnesia, | 0.842 |
| Carbonate of lime, | 86.203 |
| Sulphate of lime, | 2.061 |
| Lime, probably combined with organic matter, | 6.035 |
| Magnesia, | 0.338 |
| Potassa, | 0.191 |
| Soda and chloride of sodium, | 0.690 |
| Organic matter, | 3.613 |
| | 99.613 |

The same shell, burned till nearly all the carbonic acid and organic matter were expelled—100 parts gave of

| | |
|---|---|
| Phosphates of iron, lime, and magnesia, | 0.800 |
| Lime, | 91.918 |
| Magnesia, | 0.560 |
| Potassa, | 0.316 |
| Soda and chloride of sodium, | 1.144 |
| Sulphuric acid, | 2.011 |
| Carbonic acid, | 2.050 |
| Organic matter, | trace |
| | 98.799 |

From these analyses it will be seen that the shells of the clam contain a much larger percentage of phosphates, magnesia, potassa and soda, than those of the oyster; while the latter are much the richest in lime and sulphuric acid.

Yours truly,

J. H. Salisbury, State Chemist.

*Old State Hall, Albany, Feb. 14th,* 1853.

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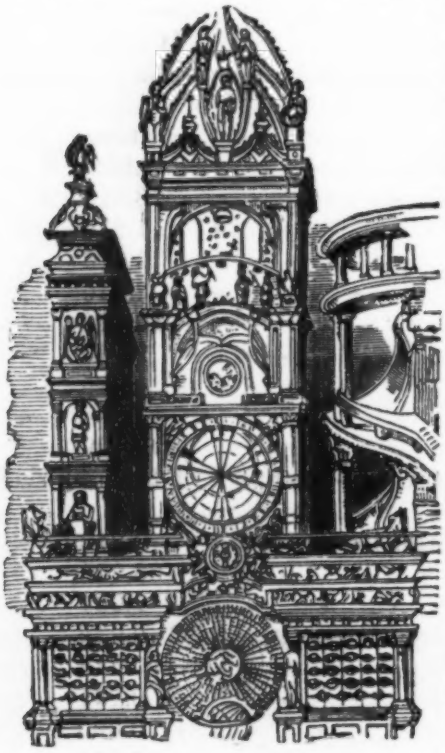
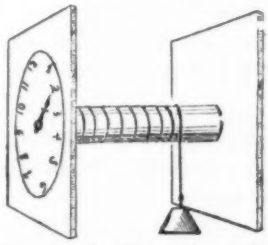
## THE MECHANISM OF A CLOCK.

Horology, or the art of measuring time, is of ancient date. The "gnomon," which subsequent improvements converted into the sun-dial, was probably one of the earliest instruments employed in measuring time. The progress of a tree's shadow, a phenomenon open to the observation of all, may have served as a tolerably accurate substitute for a clock; and it may very reasonably be concluded, that the vast altitude of the Egyptian pyramids was designed to represent the wide dominion of the living monarch by the shadow thrown from his mausoleum when dead. We read of the "Dial of Ahaz," seven hundred years before the Christian era; we read of another placed near the Temple of Quirinus, some two hundred and ninety years before Christ. Water clocks were employed at an early period by the Romans. At first, these instruments indicated time by the gradual dropping of water from an elevated vessel, or reservoir, to a receiver beneath; and the reservoir being graduated, the empty part showed the number of hours that had elapsed since it was replenished. As the laws of hydrostatics became known, it was soon discovered that water passed faster out of a full vessel than a half-emptied one, and the plan was abandoned. The earliest complete clock, moved by weights, of which we have any records, was constructed



by a Saracen mechanic, early in the 13th century, and who received some 10,000 dollars for his ingenuity. An artist, James Doudi, in the 14th century, constructed a clock for the city of Padua, which was considered as a great wonder. In 1368, the manufacture of clocks was no novelty in England, and they have continued to be improved, and have become one of the necessaries of life. It is fit, therefore, that every body should understand their construction. We shall divide the machine into two parts, explaining first the part which marks the time, and next the part which strikes the hour, using the words of "*The Schoolmate*" for this purpose.

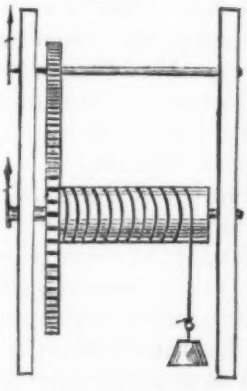
Fig. 1.



Suppose a roller or spindle to be fixed so as to turn freely, as in the accompanying cut; if a string be wound around the roller, and a weight attached to it, the roller will, of course, turn round till the weight reaches the floor, or the cord is all unwound. In this manner the wheels of clocks are made to turn, and it is only necessary to make the roller turn so slowly that the pointer fastened to it outside of the board may go round the dial circle but once in twelve hours, and the clock, though an imperfect one, is finished. Divide the circle into twelve parts for hours, and it will keep tolerable time.

But, though it will mark the hours, it cannot tell the minutes. This must be done by another pointer, moving twelve times as fast. Fig. 2 shows how the arrangement is made. The roller with the weight attached has a wheel fastened to it, which must turn with it. The edge of this wheel is cut into seventy-two teeth, or cogs, and above it is another roller, with a small wheel, having six cogs. These teeth lock into each other, so that when one wheel turns, the other must turn also. As there are twelve sixes in seventy-two, it is evident, that while the large one turns once, the small one must turn twelve times.

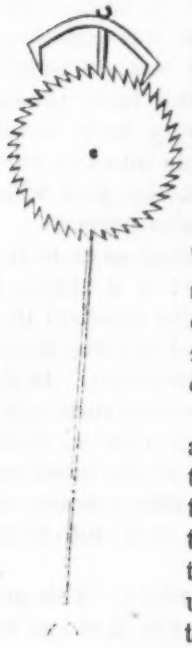
Fig. 2.



Now, if the lower wheel turns once in twelve hours, the upper pointer will move round the dial every hour, thus pointing out the minutes; so that we now have an hour-hand and a minute-hand—awkward ones, it is true, for here they have separate dials, and they turn in opposite directions. They are both placed in the centre of one dial by running the axis of the minute-wheel through the centre of the hour-wheel, so that both may turn freely without interfering with each other; and they are made to turn in the same direction by adding other cogged wheels, called motion-wheels. The clock will then tell the hours and minutes.

But we have *supposed* that the hour-wheel turns once in twelve hours, though it is evident that the clock, as soon as wound up would begin to run down rapidly, and soon stop; it must have a slow and e en motion. The machinery to effect this is called the *regulator*, and is the most important part of a clock. The regulator of a clock is a pendulum, which swings back and forth at regular intervals, when it is set in motion. It was invented by the celebrated Galileo, who thought of it while watching the great lamp of the cathedral swinging slowly by its long cord. The manner of applying it to regulate clocks may be seen in Fig. 3, where the pendulum is seen with a small curved piece of metal fastened to it, just under the pivot it swings from. This is called the anchor, and moves with the pendulum.

Fig. 3.



It is bent into two little pallets at each end, which catch into the teeth of the wheel, and then let it go again, as the pendulum swings. The toothed wheel is connected with the other wheels, so that it would turn very rapidly if not prevented by the pallets of the anchor. Let the pendulum be raised up, as represented in Fig. 3; the left-hand pallet is also raised, so that one tooth escapes, and the wheel begins to turn, but the other pallet catches and stops it. The pendulum returns by its own weight, and another tooth escapes. The wheel turns again, until the opposite pallet catches, and so it goes on, the wheel being obliged to turn round in exactly one minute. This contrivance is called an *escapement*, and the striking of the pallets against the teeth produces the sound called ticking.

A long pendulum vibrates more slowly than a short one, and therefore the movement must be regulated by moving the weight of it up or down on the wire. To understand this, and many other curious properties of the pendulum, go to your philosophy. We now have a clock that will mark the hour and minute exactly, but it will not tell it aloud, until we add some striking machinery. This, unlike the time-keeping machinery, moves only once an hour, and then very swiftly. They must, therefore, be entirely separate from each other, and each have its own weight or spring to move it; yet at the moment of striking they must be connected.

Fig. 4.

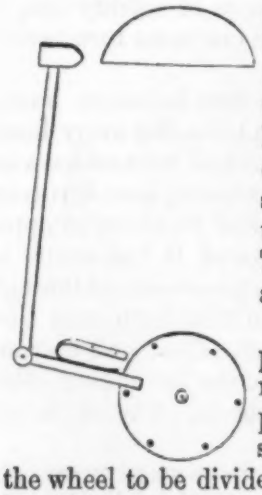


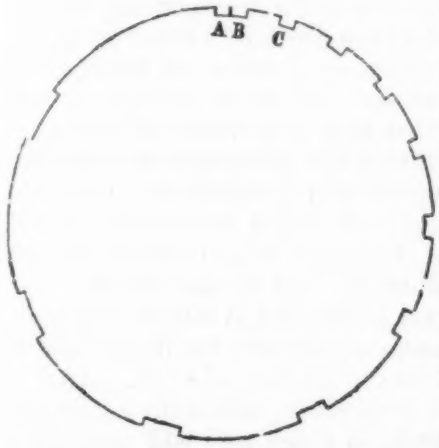
Fig. 4 shows how a clock strikes. The wheel has a number of pegs near its edge, which, when it turns from left to right, raise the tail of the hammer, and draw it back from the bell. When the hammer-tail has passed the peg, it is forced down by the spring, so that the hammer returns and strikes the bell. The next peg draws it back again for a second stroke, and it continues striking as long as the wheel turns. But when wound up, it would continue to strike till the weight runs down. The question now is to make it strike but once an hour, and then only the number of strokes required.

This is generally effected by what is called a striking-plate, which is a circle divided into unequal portions by notches on its circumference, as in Fig. 5. The principle on which the circle is notched is this: a clock strikes seventy-eight times in twelve hours; and if we suppose the wheel to be divided into seventy-eight equal parts, the distance from A to B will be one of the parts, from B to C two, the next distance three, and so on to twelve, making seventy-eight in all. The first two notches are joined together. This striking-plate must be fastened to a wheel with seventy-eight teeth, working into a small wheel of six teeth, which is fastened to the peg-wheel, (Fig. 4,) so that while the striking-plate advances 1-78 of its circumference, as from A to B, the pin-wheel will advance 1-6, one peg will pass the hammer-tail, and the clock will strike *one*.

It would continue to strike, were it not for a little pallet which falls into the notch and stops the wheel. This pallet is on the end of a lever which rests by the side of a wheel in that part of the clock which is always running. This wheel revolves once every hour, and has a pin near its edge

which presses upon the other end of the lever, raises the pallet out of the second notch, B, (Fig. 5,) and the clock strikes *one, two*, because the second distance is double the first, and the hammer-tail (Fig. 4) passes two pins on the wheel. The pallet now falls into the notch at C, and the whole striking machinery is motionless until the pin in the hour-wheel comes round again, when *one, two, three* is struck—so on to *twelve*. A fine wire generally hangs on the end of the lever, within reach of a person's fingers. If the clock strikes wrong, it may be made to strike right by pulling the wire which raises the pallet from its notch, just as the pin in the hour-wheel does.

FIG. 5.




We have thus given a correct description of the principal machinery of a common clock. We do not mean that we have given exact pictures of all the wheels, &c., for these would not be understood; but we have shown in a familiar way how the machinery moves to keep correct time, and tell the hour by striking. The clocks we have described are of the simplest kind, such as are found in almost every house; for all are not made alike. Some strike the *quarters*, as well as the hour, and others are fitted up with a great deal of curious machinery, like the great clock of Strasburgh Cathedral, which not only told the time, but also the motions of the heavenly bodies, and the day of the week and month. On its top was a golden cock, that crowed and flapped its wings every hour. The hour was struck by figures of the Twelve Apostles, who marched in a line around the clock-bell. A picture of this famous clock is given at the head of this article. It has been repaired twice, but is not now in use. All these complicated movements were produced by means of levers, pulleys, and inclined planes, which are the only mechanical powers known.

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## HOW TO MAKE A HOT-BED.

MOORE'S *Rural New-Yorker* gives the following directions how to make a hot-bed:

"Though little explanation seems necessary, yet we will give condensed directions for the formation and management of hot-beds:

"The frame of the hot-bed is made of 2-inch plank, nailed to upright posts in each corner. Ten feet long and 6 feet wide is a good size: the back may be 30 inches high and the front one half that, to give a proper slope of roof for shedding rain and throwing the light and heat upon the plants. For the sashes to rest and slide upon, a strip 6 inches wide is placed across the frame, even with the edge of the same. The sashes are made in the ordinary way, but without cross-bars; and the panes of glass are set to lap on each other one fourth of an inch, so as to shed the rain. For the preparation of the bed we find the following directions given by Mr. Barry:

"'Hot-beds should occupy a dry situation, where they will not be affected

by the lodgment of water during rains or thaws. They should be exposed to the east and south, and be protected by fences or buildings from the north and north-west.

"'Where it is intended merely to grow plants for transplanting to the garden, they may be sunk in the ground to the depth of 18 inches, and in such a case require not more than 2 feet of manure; but when forcing and perfecting vegetables is designed, a permanent heat must be kept up, and the bed must be made on the surface, so that fresh and warm manure may be added when necessary. A depth of 3 to 4 feet of manure will in such cases be wanted. Manure for hot-beds requires some preparation. It should be fresh stable manure, placed in a heap, and turned and mixed several times, promoting a regular fermentation. It is thus made to retain its heat a long time; otherwise it would burn and dry up, and become useless.

"'The mould should be laid on as soon as the bed is settled, and has a lively, regular-tempered heat. Lay the earth evenly over the dung about 6 inches deep. Radishes and lettuce require about a foot of earth. After it has lain a few days, it will be fit to receive your plants, unless the mould has turned to a whitish color or has a rank smell, in which case add some fresh mould for the hills: at the same time vacancies should be made to give vent to the steam, by running down stakes.

"'Those who wish to force cucumbers, &c., should begin, if the weather is favorable, by the first of March. For raising plants, the middle is time enough.'"

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## AGRICULTURAL PROSPECTS OF GEORGIA.

The Savannah *Republican* says: "We had the pleasure, some days ago, of meeting an intelligent agriculturist from the North, now on a tour through the Southern States. He comes for the purpose of informing himself of the condition and prospects of Southern agriculture, and not to meddle in any way with our institutions. A few years ago, he visited England and Europe for a similar object. The subjoined extract of a private letter from Columbus to a friend in this city, embodies some of his impressions in regard to Western Georgia.

"'Though the soil of Western Georgia, to a Northern man observing superficially, seems poor and unpromising, the stubble of the corn and other evidences show it to be greatly productive, and that the crops of the last year at least were heavy and profitable. The roads, which have been almost impassable from the heavy rains early in January, are now nearly dry, and cotton is moving rapidly to market. At least two hundred wagons must have entered Columbus to-day. The country is evidently prospering and improving. Every where I observe a great deal of land being cleared and preparing for the coming season. A great many new houses, stables, and negro settlements are building, and I have seen several new churches in the woods. Extensive hill-side ditching and swamp draining is going on, and I have noticed guano in the returning cotton wagons. The country people with whom I have conversed are the most busy, hopeful, and ambitious that I have seen at the South.

"'There is one agricultural operation that will, I think, eventually add much to the wealth of Georgia, which seems not yet to have been thought of. There are frequent watercourses, and the sandy soil is exactly of the character best adapted for irrigation. I have little doubt that forage crops

could be made in water-meadows in this soil and climate more profitable than cotton. Five tons of hay a year would be a small crop to expect from a water-meadow. It would not cost five dollars a ton to cut and make it. You now, in Savannah, send to the North and pay thirty dollars a ton for it.'"

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## FAMILIAR LETTERS ON PRACTICAL AND SCIENTIFIC HUSBANDRY.

### No. II.

### HISTORY OF AGRICULTURE.

"In ancient times, the sacred plough employed
The kings and thoughtful rulers of mankind."

THE first mention of agriculture is found in the writings of Moses. In them we learn that Cain was a "tiller of the ground;" that Abel sacrificed the "firstlings of his flock;" and that Noah "began to be a husbandman, and planted a vineyard." History is silent as to the means or implements used for tillage by these antediluvians. The Chinese, Japanese, Chaldeans and Phœnicians are known to have held husbandry in the highest honor. They viewed it as the spring which sets the whole machine in motion.

Agriculture was in no part of the world, however, in higher consideration than in Egypt, where it was the particular object of policy and government. The Egyptians were so sensible of its blessings, that they ascribed its invention to superhuman agency, and carried their gratitude so far as to worship the ox, because he trod out the corn. Whether they invented the plough or not, certain it is that the genius of that remarkable people employed itself strenuously in remedying the scarcity and redundancy of the Nile, by regulating its banks so as to irrigate their lands. It was this irrigation which made Egypt the granary of the world. She moistened and matured her soil by the rich slime and mud that the Nile brought down in its bosom. Their plough was but a simple instrument, as they had only to harrow their grain into the mud, on the retiring of the Nile, and in the March following they found a plentiful harvest.

The Carthaginians carried the art of agriculture to a high degree among their contemporaries. Mago, a Carthaginian general, wrote twenty-eight books on agricultural topics, which were translated into Latin by an express decree of the Roman Senate. The Satrapæ, among the Assyrians and Persians, if the lands in their governments were well cultivated, but were punished if that part of their duty was neglected. Africa abounded in corn; and for a long period Africa and Egypt became the storehouses of Rome. Hesiod, a Greek writer, supposed to be contemporary with Homer, wrote a poem upon agriculture, entitled "WEEKS and DAYS," because, he said, husbandry requires an exact observance of times and seasons. Xenophon also wrote a work called "Economics," which set out the "advantages of husbandry and a country life." The implements of Grecian agriculture were very few and simple. Hesiod mentions a plough, consisting of three parts—the share-beam, the draught-pole, and the plough-tail, but we know not its exact form; also a cart with low wheels, seven feet six inches in width; likewise the rake, sickle, and ox-goad. The operations of Grecian culture were neither numerous nor complicated. The ground received three ploughings, one in autumn, another in spring, and a third just before sowing the seed. Manures were applied,

and Pliny ascribes their invention to the Grecians. Theophrastus mentions six species of manures, and that a mixture of soils produces the same effects as manures. Clay, he remarked, should be mixed with sand, and sand with clay. Seed was sown by hand, and covered with a rake. Grain was reaped with a sickle, bound in sheaves, thresbed; then winnowed by wind, laid in chests, bins, or granaries, and taken out as wanted, to be pounded in mortars. Such was Grecian agriculture about 1000 years B. C.

The ancient Romans venerated the plough; and in the purest times of the Republic, the greatest praise that could be given to an illustrious character was to say that he was an industrious and judicious farmer. Cato, the Censor, derived his highest and most durable honors, not for his statesmanship, generalship, or oratory, but for having written a voluminous work on agriculture. Virgil, Pliny, Varro, Palladius, were distinguished Romans who wrote on agricultural subjects. Of the celebrated Cincinnatus, who was taken from the plough to command the Roman armies, we read:

> "The Romans, as historians all allow,
> Sought, in extreme distress, the rural plough;
> *Io triumphe!* for the village swain
> Retired to be a nobleman again."

The Roman implements of agriculture, from all we can ascertain, appear more worthy the notice of the antiquarian than of the practical farmer. Cato describes their plough as of two kinds, one for strong and the other for light soils. Varro mentions one with two mould-boards, with which, he says, "when they plough, after sowing the seed, they are said to ridge; that is, with boards added to the share, they at once both cover on the ridge the seed sown, and draw furrows for carrying away the rain-water." About the middle of the 18th century, an English author says: "It appears that the ancients had all the different kinds of ploughs that they have at present in Europe, though perhaps not so exactly constructed. They had ploughs without mould-boards, and ploughs with mould-boards; they had ploughs with coulters, and ploughs without coulters; they had ploughs without wheels, and ploughs with wheels; they had broad-pointed shares, and narrow-pointed shares; they even had what I have not as yet met with among the moderns—shares, not only with sharp sides and points, but also with high and raised cutting tops. Were we well acquainted with the construction of all of these, perhaps it would be found that the improvements made by the moderns in this article are not so great as many persons are apt to imagine."

Fallowing was a practice rarely deviated from by the Romans. A fallow and a year's crop generally succeeded each other. Manure was collected from nearly as many sources as have been resorted to by the moderns. Pigeons' dung was esteemed of great value, and, next to that, a mixture of night-soil, scrapings of the streets, and urine, which were applied to the roots of the vine and olive. The Romans did not bind their corn into sheaves. When cut, it was sent into the area to be threshed, and was separated from the chaff by throwing it from one part of the floor to the other. Watering, on a large scale, was applied both to arable and grass lands. Virgil advises to "bring down the waters of a river upon the sown corn, and, when the field is parched and the plants drying, convey it from the brow of a hill in channels." The farm management most approved of by the scientific husbandmen of ancient Rome was, in general, such as should meet the approbation of modern cultivators. Cato, when asked what was the best culture of land, replied, "Good ploughing." What is the next best? Replied again, "Ploughing."

In reply to what was the third requisite, he made answer, "The application of manures." Cato's replies conform to present experience, and show

> "There's nought
> In vain demands the farmer's care. He ploughs,
> He sows, he reaps, and gathers into barns;
> Then rests from toil, to cultivate the mind,
> Learns from the past the present to improve."

The Romans seem to have known the folly and slavery of cultivating *too much land*, and their experience proved that a man may spend all his time as usefully and profitably on an acre as many could do on fifty. They illustrated their belief of this fact by the following apologue: A vine dresser had two daughters and a vineyard. When his eldest daughter was married, he gave her a third of his vineyard for a portion, notwithstanding which he had the same quantity of fruit as formerly. When his youngest daughter was married, he gave her half of what remained; still the produce of his vineyard was undiminished. This result was the consequence of his bestowing as much labor on the third part as he had been accustomed to give the whole vineyard.

To the Romans were the ancient Britons indebted for a knowledge of agriculture. When Britain was subject to the Romans, she annually supplied them with great quantities of corn, and the Isle of Anglesea was then looked upon as the granary of the country. But the Britons, both under the Romans and Saxons, were nearly slaves, and as such employed at the plough. The conquest of England by the Normans first contributed to the improvement of agriculture in that country. Owing to that event, thousands of husbandmen from the fertile and well cultivated plains of Flanders and Normandy settled in England, obtained farms, and employed the same methods in cultivating them which they had been accustomed to in their native countries. Some of the Norman barons were celebrated for their agricultural skill. The Norman clergy and the monks retained much lands, and these they cultivated under their own supervision, with much care. We read of the famous Thomas à Becket, after he was Archbishop of Canterbury, going into the fields with the monks of the monastery where he resided, and joining them in reaping their corn and making their hay. The implements of agriculture, at this period, were similar to those in most common use in modern times. We are not able to collect a definite account of the manner in which the various operations of manuring, ploughing, sowing, harrowing, reaping, threshing, winnowing, were performed. The first treatise on husbandry in English was published in the reign of Henry VIII., by Sir A. Fitzherbert, Judge of the Common Pleas. It contains directions for draining, clearing, and inclosing a farm; for enriching the soil, and rendering it fit for tillage. It recommends lime, marl, and fallowing. In 1562, "Tusser's Five Hundred Points of Husbandry" was published, and gives useful instruction. During the reign of "Queen Bess," agriculture attained some eminence. Several writers on agriculture appeared in England during Cromwell's Commonwealth; but from this period down to the middle of the eighteenth century, agriculture remained almost stationary. Immediately after this period, considerable improvement in the process of culture was introduced by Jethro Tull, a Berkshire gentleman, who began to drill wheat and other crops about the year 1701, and who also published a work on "Horseshoeing Husbandry." Though this writer's theories and hostility to manures were often erroneous, these errors were serviceable by calling the attention of husbandmen to important objects. Chemistry had not then pointed out the true connection between the plant and the soil. After Tull's publication no great alteration took place until about 1760. Robert

Bakewell took the lead in effecting important improvements in the breed of cattle, sheep, and swine. By skilful selection at first, and constant care afterwards to breed from the best animals, Bakewell at last obtained a variety of sheep which, for early maturity and the property of returning a great quantity of mutton for the food they consume, as well as for the small proportion which the weight of the offal bears to the four quarters, were without precedent. The names of Cully, Cline, Somerville, Darwin, Hunt, Young, Pringle, Dawson, Mickle, are well known to well-read agriculturists in this country as having contributed to the improvement of domestic animals, and have left that branch of rural economy in a very forward state in England. The raised drill system of growing turnips, the use of lime, and the convertible husbandry, came into general use about 1765; the improved swing-plough, about 1790, and Mickle's improved threshing-machine, about 1795; the field culture of the potato, shortly after 1750; the introduction of the Swedish turnip, abont 1790; of spring wheat, about 1795; of summer wheat, about 1800.

For much of all later improvements, agriculture in that country is indebted to the labors and genius of Arthur Young, Lord Kaimes, Dr. R. W. Dickson, John Loudon, Henry Stephens, the Highland Society of Scotland, and the establishment of a national Board of Agriculture. These individuals have brought the art of agriculture into fashion and *ton;* old practices are being amended and new ones introduced. The value of her agricultural products has, in consequence, doubled during the last half century.

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## USEFUL DISCOVERIES.

We find the following paragraphs in the *Scientific American.*

*Plaster Casts of Leaves and Flowers.*—The leaf, as early as convenient after being gathered, is to be laid on fine-grained moist sand, in a perfectly natural position, with that surface uppermost which is to form the cast, and to be banked up with sand, in order that it may be perfectly supported. It is then, by means of a broad camel-hair brush, to be covered over with a thin coating of wax and Burgundy pitch, rendered fluid by heat. The leaf is now to be removed from the sand, and dipped in cold water; the wax becomes hard, and sufficiently tough to allow the leaf to be ripped off, without altering its form. This being done, the wax mould is placed in moist sand, and banked up as the leaf itself was previously; made thin, due care being taken that the plaster be nicely pressed into all the interstices of the mould, by means of a camel-hair brush. As soon as the plaster has set, the warmth thus produced softens the wax, which, in consequence of the moisture of the plaster, is prevented from adhering to it, and with a little dexterity it may be rolled up, parting completely from the cast, without injuring it in the least.

Casts obtained in the manner thus described are very perfect, possessing a high relief, and form excellent models, either for the draughtsman or for the moulder of architectural ornaments.

*Tanned Gelatine or Artificial Horn.*—A manufactory has been established in Paris for the construction of a variety of ornamental articles with this substance. The gelatine is usually obtained from bones by treating them with a weak solution of muriatic acid, and is afterwards tanned by the common process, as in making leather. Upon becoming hard and dry, it assumes the appearance of horn or tortoise-shell, and is employed for the same purposes as

those natural productions. It is softened by being boiled in water with potash, when it may be formed into any shape, and the figure preserved by drying the articles between moulds. In the soft state, it may also be inlaid with gold, silver, or other metals, and it may be streaked with various colored materials, so as to resemble the finest and most beautiful woods. It is probable that this substance will soon be brought very extensively into use, on account of its elegance and cheapness.

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## UPLAND RICE.

We have seen so many fine upland rice patches, during the few past years, that we regard it certain this grain can be cultivated in most parts of the State. If we recollect aright, we once read of a remarkably heavy yield grown by some gentleman in Pendleton. In our own neighborhood, from fifty to one hundred bushels of rough rice have frequently been produced to the acre, and this product might be largely increased. It is valuable as food for poultry, domestic animals, and though not so fair and marketable as the world-renowned product of our sea-coast, it would, nevertheless, furnish our laboring classes with a cheap and nutritious article of food, if hulled by simple machinery.

The culture of rice in the low wet lands of the Cherokee (Geo.) country is recommended in an article in which the writer says:

"I will endeavor to explain how to prepare the field: Take one of our branches, the more level the better, with a spring at its head. Cut a ditch on the upper side, and keep the water as much on a level as you can. To drain it above the field, make a band with the earth excavated on the inner side. On the lower side, cut a larger ditch to carry off the surplus water from the drain. Divide your land by cross-banks and ditches, so as to have an equal depth of water when the land is flowed. In each field you must have two trunks, one on the upper ditch, to take in the water; the other on the lower ditch, to let off the water. When your land is thus prepared, drill it with hoes, 15 inches asunder, and 3 inches deep; commence to sow about the 15th of April; put two and a half bushels gold rice to the acre; cover it with a bat. Then let the water on, and allow it to remain five days. Then draw it off. Let the rice remain dry until the plant has four leaves; hoe, clean, and stir the earth deep below the rows; keep out the grass, and put on the water fourteen days, allowing the ends of the rice to be seen; draw it off; hoe again as often as convenient. Let the rice remain dry until it joints, then put back the water, and let it remain until it is fit for the sickle; occasionally changing it to prevent stagnation and sickness: and by the time the next season comes around, you will have a fine rice mill to prepare your crop for market."—*Southern Agriculturist.*

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## GOOD BREAD—NEW AND OLD BREAD.

Some of our Agricultural Societies offer premiums for good bread, and require, in return, a statement of the process by which the result is attained. We commend this subject to more general attention, for, as we have said elsewhere, we consider bad bread a leading cause of a large proportion of the

pettishness and peevishness indulged by so many in the intercourse of those who, being very intimate, disregard the checks and balances secured by the observance of the rules of ceremony. But a large proportion of the bread in some communities is scarcely more than an active form of yeast, thrown into the stomach only to produce fermentation and a host of disorders. And then we witness, of course, the blue vapors, which, under different aspects, are as ruinous to the peace of a family as are those of a distillery.

But we were surprised to see, in a Report of the Committee of *the* Norfolk County Society, the following sentence: "Milk, molasses, alkalies, should never be used; they only deteriorate and take from its excellence. Neither should any of these ingredients enter into the composition of the yeast." If molasses were used in large quantities, we have no doubt the evils suggested "hasten and bring about the second and third fermentations, through an excess of saccharine matter." But we doubt whether a moderate quantity of this popular *sweetener* so essentially increases the tendency to fermentation that its use should be totally discarded. And we are still more taken by surprise at seeing milk placed in the same category. The tendency to fermentation *in milk* is probably less after it is eaten than when exposed to the oxygen of the atmosphere. Babes and children live on milk to a great extent, and we are not satisfied that it is an unwholesome diet, as it certainly would be if it had a special tendency to fermentation. And it will not be denied that a liquid ferments far less rapidly when absorbed by solids than when in its original state. According to the experiments of Dr. Beaumont, milk is digested in about half the time required by "fresh" bread.

The conditions favorable to fermentation are warm temperature and liquidity. Hence, bread mingled with milk is not so liable to ferment under the influence of animal heat as pure milk, especially if the latter is used in large quantities. But as this favorite article of food and drink is not found unwholesome to most persons, even when used freely, so we think the evidence is entirely wanting that the same rich gift of Providence is injurious when mingled, as in the dough, with a wholesome kind of food. And he who knows the excellence of bread as thus prepared by farmers in the country, will hardly be ready to pronounce such food unwholesome.

We believe this mistake to have arisen from undue respect to scientific theories. This appears the more obvious explanation, when we discover the adoption of what we regard as another mistake, apparently from the same cause. To most persons new bread is unwholesome. Though some deny it, most acknowledge it to be so. Our own opinion has facts almost innumerable to rest on. But why is it unwholesome, when a day or two of *ripening* will make it one of the most wholesome articles of diet? This Report says, "It should be placed in some open, airy situation, that it may imbibe the oxygen, instead of being covered up, as is often the case, thus preventing the hydrogen from being thrown off by a proper process of cooling." The author of this Report is too judicious and too learned to sign his name to what has been proved to be error; but has he not here gone beyond the testimony? Where is the evidence that oxygen is absorbed, or that hydrogen is "thrown off"? We have supposed that this, at best, was mere hypothesis, without a solitary fact to sustain it. Besides, we would ask, what does the oxygen unite with? With the bread? By what chemical law? Is old bread found richer in oxygen than new bread? And again: where does the escaping hydrogen come from, and how does this change the substance from which it escapes? Before we receive this theory, we want light on these points.

We have yet to learn that actual analysis has detected any changes of this sort. And we therefore fail to receive conviction of the truth of the theory. Nor do we know why the loss of hydrogen or the addition of oxygen *in the stomach* should be material. Carbon and carbonic acid are both healthful in their action within that organ, while they are fatal on the lungs. But we are not aware that uncombined oxygen or hydrogen produce in the stomach any important effect, whatever may result from their presence in the lungs. Nor is it *warm* bread that is so mischievous. New bread may be cooled thoroughly, and it is still unwholesome to many persons. The theory that *seems* to us most plausible and best sustained by known facts is that which refers the more ready digestion of old bread to physical, rather than to chemical changes. Digest new and old bread in water, and knead the two kinds; one rolls up like paste, and is impermeable to water or other liquids, while the old bread is comparatively free from adhesive properties.

And this, we suppose, is the consequence of the solidifying of the gluten, which in new bread is scarcely more than semi-fluid. Exposure to an ordinary atmosphere so dries and hardens the gluten, that even a re-digestion fails to reproduce the effects before witnessed. If this is so, it is not the only substance which exhibits similar phenomena.

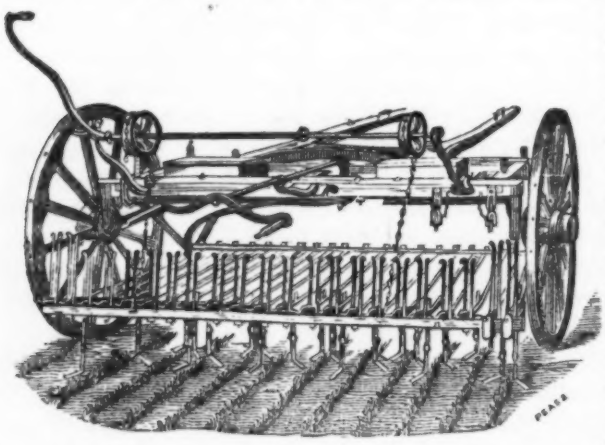
But we do not speak *ex cathedrâ*. We favor this opinion for want of any sustained by more plausible evidence, or in better accordance with established scientific principles. While we present these views of the subject, we do so rather to get light than to communicate, and we hope we may obtain it from some of our learned correspondents.

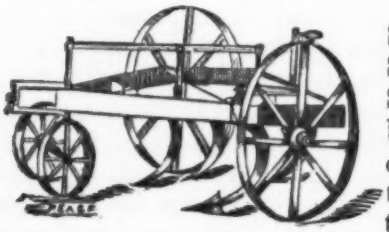
One thing, however, is certain. Fermented bread, when properly made, is essentially sweeter than when it is made light by some of the modes now so extensively adopted. A small quantity of carbonate of soda or of potash may not be unwholesome, particularly to those whose food is apt to ferment before it is digested. But the production of carbonic acid gas by the fermentation of the dough *creates* a quantity of sugar, which essentially changes the character of the bread. Whether all persons can discover the difference or not, bread made light by yeast, and properly cared for, is sweeter than "soda bread." It may not be more wholesome; it must of necessity contain more sugar. A paragraph found its way into our February number which differs, in some respects, from these positions, but it ought to have been accompanied by a note, which was omitted. It was published only by accident. Our attention has been drawn to it by a friend, who objects to the amount of soda used; who thinks one dram of the bicarbonate of soda sufficient for three pounds of flour. We suppose that generally an excess of the soda is not hurtful, unless used very freely. Then it is liable to the general objection against all medicinal articles by persons in good health.

Note.—Since the above was in type, we have seen the following, in the last *Annual of Scientific Discovery*. A discussion took place before the French Academy on the question, "Why bread becomes stale." "M. Boussingault laid down that staleness is not, as is generally supposed, caused by the proportion of water diminishing, but arises from a molecular state which manifests itself during the cooling, becomes afterwards developed, and persists as long as the temperature does not exceed a certain limit. M. Thenard said, it is caused by bread being a hydrate, which heat softens, and to which a lower temperature gives more consistency." A *hydrate*, as many of our readers know, is a substance in combination with water. These views, it will be seen, perfectly harmonize with the ideas above presented.

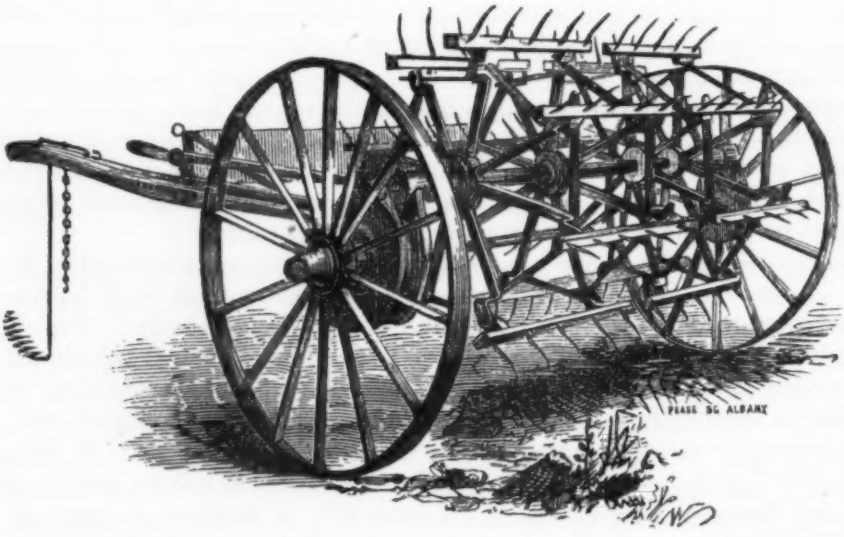
## ENGLISH FARM IMPLEMENTS.

The following illustrations of English Agricultural Machinery, for which we are indebted to the *New-York Agricultor*, are worthy the notice of our farmers. The first cut is Garrett's Patent Horse Hoe. It is a sort of universal cultivator mounted on wheels, which enables the operator to regulate the depth of working as he may desire. The teeth are set in an iron frame, and so arranged as to be two feet apart, each tooth cutting eight inches, by which all the ground is hoed over. There are two other sets of teeth; one for grubbing, or breaking up the soil, and another set of steel shares for working stubble-land. The frame carrying the teeth can be raised in a moment, so as to clear them of the ground, and thus be carried from one field to another. This is one of the advantages of mounting the machine on wheels.





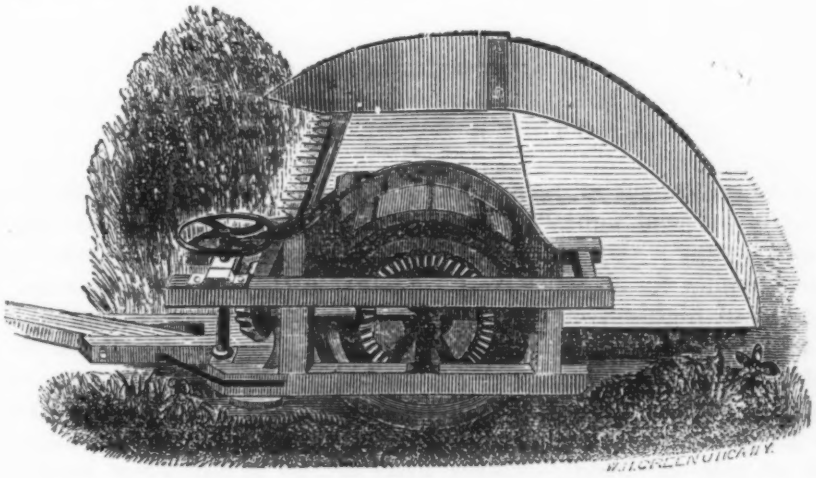
The accompanying cut is called the Uley Scarifier, and is said by Col. B. P. Johnson, Secretary of the New-York State Agricultural Society, to be very efficient in pulverizing stubble-land, whether light or heavy, and also in clearing it of grass and weeds. The Colonel thinks it might be used by American farmers to as good advantage as it is by English ones. It does not cost much.



HAY-MAKING MACHINE.

Every boy in this country who has toiled over heavy swaths of new-mown

grass, will hail with joy the introduction of a machine which will enable him to perform that labor faster and better by horse than hand-power. The above machine is represented as competent to do all this. Col. Johnson says, that one man can work it, raise and lower the spreader to its work, or throw it out of gear, in a moment. The inventor claims that he can do the work of twenty men. Col. Johnson says, "Of this there is no doubt, as we have frequently seen them at work in England, and can therefore vouch for their performance from actual observation."



BURRALL'S REAPER.

In this age of Reaping Machines, the public can hardly obtain a knowledge of their varying shades of merit before new competitors appear. The above cut will give our readers an idea of the appearance of Burrall's Reaping Machine, which took the $50 premium at the trial of implements by the New-York State Agricultural Society. This circumstance, to begin with, is good evidence of its satisfactory capabilities. The shaft which is seen projecting from the machine on the left hand is attached to the axle of a pair of wheels, upon which is fixed a seat for the driver. The machine itself has no wheels except those which form a part of the operating machinery. The raker rides on the machine, and throws the grain, with a sweep of his rake, around the semicircular platform off on the outside of the *through* just cut, so that the gavels are not in the way of the next round. It is usually worked by two horses, but can be operated by oxen just as well, if they are trained to a quick walk. The cutting principle is similar to that of Hussey's, and this may be considered an improvement on his machine. It is not encumbered with a reel, like McCormick's, on which account it is preferred. The Committee reported in favor of this machine after a fair trial in competition with eight others. We hope yet to see the best improved.

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## LIME ON COTTON.

We heard the other day of an experiment made by a friend of ours, which resulted so favorably that we have been induced to get the particulars from him, in order that others may be benefited by it.

During the month of February, he opened deep trenches in a piece of old upland, which were at once filled up with leaves from the neighboring wood-

land, tramped down hard. On top of the leaves he sowed lime at the rate of about 15 bushels to the acre. At the usual time for planting cotton, he opened the ridges with a coulter, dropped and covered the seed, and cultivated the cotton in the usual manner. The result was a crop of cotton double what the land would have produced otherwise—that is, it brought 1000 lbs., when its usual yield was from 400 to 500.

It has struck us that this plan of manuring cotton would pay well. Perhaps some of our planting friends can throw some light on the subject.—*Athens Herald.*

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## ANOTHER SAFETY LAMP.

Among the various substances and combinations in general use for the production of artificial light, "*Burning Fluid*," "*Ethereal Oil*," "*Spirit Gas*," &c., &c., occupy a very prominent place. These, as many are aware, are but different names for an article very similar in its nature and properties, being composed of highly rectified alcohol which has been carbonized by any of the essential oils, resins or resinous gums, and consequently, under ordinary circumstances, very volatile and inflammable. On being burned in an open vessel, it produces a brisk flame with a strong heat, but *it is not explosive.* The same fluid, however, closely confined in the common portable or other lamp, either of glass or metal, becomes more or less heated while burning, and generates a vapor or gas which under ordinary circumstances is harmless. Confined within the lamp, uncombined with oxygen and not brought into contact with flame, it is never dangerous; but if, from the removal of the cap or feeder of the lamp, this gas is allowed to escape and unite with the atmosphere, and then come into contact with a flame, an explosion is the consequence. Such "accidents" frequently result from filling the lamp while it is burning, and constitute more than four fifths of all the "explosions" that occur from the use of these burning fluids, (generally, but very improperly called "*Camphine,*") all of which are solely the result of carelessness. There is, however, another cause of accidents from burning the volatile oils; and this is the flow of the burning material over the tops of the wick tubes, from the pressure of the gas within the lamp, which forces the liquid through the wick tubes, and brings it immediately in contact with the flame itself. This burns with a strong flame on the outer surface of the lamp, and, from the heat thus produced, either melts or breaks it. Apart from these two causes, accidents from *burning fluid* could scarcely ever occur, and its use would be attended with no more danger than ordinary lights.

Now, to remedy these evils is the object of an invention by Professor Horsford. To obviate the former, he has attached a *safety tube* of tin or other metal, extending nearly to the bottom of the fountain or reservoir containing the fluid, and communicating therewith through the lower end of the same, which is capped with very fine wire gauze, and is a complete safeguard against either the spirits or volatile gas within the lamp itself taking fire even while filling it. This tube contains the wick while the lamp is burning, and, as will at once be perceived, embodies the principle of Sir Humphrey Davy's Safety Lamp for preventing explosions from "*fire damp*" in mines, collieries, &c., &c.

In order, however, to render the lamp still more free from danger, and to obviate the second cause of accidents, Professor H. has appended a separate chamber or reservoir to the base of the wick tubes, which, in case of an over-

flow of the fluid from the expansion of the gas before mentioned, receives that portion which is forced upward into the tubes and allows it again to descend into the reservoir below. This is also protected by wire gauze, completely preventing any communication of flame to the fluid or gases within the lamp. This apparatus, together with spurs or flexible points within the wick tubes, allowing the wick to move upwards, but effectually preventing its descent into the fluid from any sudden jar or other cause while burning, constitutes the simple and effective means adopted by Professor Horsford to insure safety in burning the volatile fluids and ethereal oils now in general use. The safety principle of this lamp is essentially the same with that of Mr. Newell, described in the December number of this journal, with an additional contrivance to prevent accident from the expansion of the fluid. Which is the best form, every purchaser must judge for himself.

Messrs. Starr, Fellows & Co., Lamp Manufacturers, No. 67 Beekman street, we are informed, are the authorized agents for the sale of this lamp.

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## CHEMISTRY OF VEGETABLE GROWTH.

Agricultural Chemistry is indebted to Professor Youmans for a highly instructive lecture on the chemistry of vegetable growth, lately delivered at the Tabernacle, of this city, to a very attentive audience. No subject possesses instruction more curious, or phenomena more interesting, than the science of vegetable life. A plant is a living being. Living beings are distinguished from inanimate bodies by peculiar characters; their existence depends upon certain conditions, and is regulated by determinate laws. It is obvious, therefore, that there can be no scientific, and consequently no uniformly successful management of such beings without a knowledge of the phenomena of life, of the actions upon which these phenomena depend, and of the laws which regulate them. For these reasons we introduce this subject methodically to our readers.

All plants consist of two substances, cellular tissue and sap, and proper vessels; but vessels themselves being probably composed of cellular tissue, the ultimate analysis of vegetable matter would leave cellular substance alone. The cellular tissue is commonly conceived to be a solid fibre, to which vessels are added as distinct appendages. Microscopical observers contend that it consists of an infinite number of minute particles of a globular form. It obtains the name of cellular from the arrangement and intersection of its primitive fibres, which are such as to leave spaces between them, these spaces being denominated cells. There is great resemblance in appearance, and great analogy in the physical properties of this substance in both classes of living beings, vegetables and animals. The common vegetable tissues are cuticle, bark, stem, and pith. The common vessels are sap vessels and proper vessels. These are the elementary structures, by the various combinations of which all vegetables are built up or constructed. With these preliminary remarks we allow Professor Youmans to say his say on the growth of plants:

We begin with germination. Every seed contains within it the germ or embryo of a new plant. Germination is the beginning of its growth. Here, as elsewhere, growth implies increase of mass—the addition of matter from a foreign source—food. The food of the embryo is wrapped around it, constituting the chief bulk of the seed; but the solid particles have no power to move towards the germ; they must be transported; a medium is wanted for

this purpose; that medium is water. Moisture is indispensable to germination. But the nourishment which surrounds the embryo is insoluble in water, and so, under the influence of oxygen, a fermentation is begun in the seed which alters the nutritive substance so that water will dissolve it, and it thus enters the expanding germ. In this first stage, the embryo cannot be regarded as leading the true vegetable life. It is more like the animal; it consumes organized matter. It is only when this source of nutriment is exhausted, and the infant plant begins to shoot its roots downward, and open its leaves to the light above, that it begins to perform the essential office of vegetable life. We may here inquire in what way it is that the increase of matter is effected in living beings. It is by the growth of minute bodies termed cells. Cells are little sacks or bladders, so minute as to be invisible to the naked eye. They consist of a closed membraneous wall, containing a fluid, and always appear before the production of circulating vessels, or any other forms of organization.

If we burn a piece of wood, a small portion falls to the ground as ash, but much the greater part ascends into the air in the form of gases. Now, if the plant is to form another piece of wood, it goes downward into the soil after the ash, and up into the air after the gases. It was formerly supposed that the constituents of the ash were present in the plant by accident, and were such as water, falling upon the soil and entering the roots, happened to dissolve. But this was a vast mistake. Each plant requires certain earthy minerals for its healthy growth, and will not flourish without them. One demands lime, another plaster, another potash. This fact should be thoroughly understood by farmers, as without it there can be no intelligent and skilful management of soils. But the great mass of vegetable nourishment is derived from the air, as we might imagine from the form of the plant. The whole structure, trunk, branches, and leaves, shows that the object is to expose a large surface to the air. The water, which brings up dissolved minerals from the soil, exhales continually from the vast leaf surface into the air; at the same time the innumerable mouths with which the leaves are covered are busy imbibing gases from the air—carbonic acid and probably ammonia. This absorption of gases by the leaf has been variously and abundantly demonstrated. Besides its office of evaporation and absorption, the leaf is also an organ of digestion. It is the seat of all those grand formative changes which are peculiar to vegetation. The crude or ascending sap consists of water, containing dissolving salts from the soil. This mixture passes upward to the leaf, and is there changed. In other vessels, which descend from the leaf and distribute to all parts of the plant, we find another class of substances, organized vegetable products. These have therefore been formed in the leaf out of the dead minerals and gases. This is proved by the fact that plants grow or enlarge from above downward. Tie a ligature tightly round a branch, and it will be found to swell up above as the new matter accumulates. Where leaves are distributed along the branches or twigs, the branch is found to be larger below each leaf; but in those trees where the leaves are inserted as tufts upon the top of the branch its cylinder is seen to be of uniform size.

We thus see that the vegetable leaf is the factory where living things are created; where dead matter takes on the wonderful properties of life. The changes that occur in the leaf are twofold. First, analytic—the decomposition of carbonic acid, water, and ammonia. The leaf in the daytime decomposes carbonic acid, returns its oxygen to the air, and retains the carbon. Here the action antagonizes that of animals, which withdraw oxygen from the air and return carbonic acid. This decomposing power of the leaf is a field of high

interest. It is a higher analysis than that of the laboratory, for no chemist has yet succeeded in decomposing carbonic acid at common temperatures by any expedients of art, and this goes forward constantly in every leaf and every blade of grass. The second class of changes is synthetic or formative, the true constructive processes of vegetation. The decomposed gases, with the salts brought up from the soil, furnish materials for every organized product, and the atoms which form them were first put together in the leaf. It is here that all living substances originate, all the innumerable products of vegetation, and all parts of our own bodies. We thus regard all organized substances as composed mainly of gases condensed from the air. The forests represent so much solidified air, and so do our food and clothes and the solid structures of our own systems. They were all formed from lifeless matter by the exquisite and mysterious chemistry of the leaf.

We now, said the lecturer, inquire what is the motive power which, as it were, drives the vegetable machine. We shall find it in the radiations which proceed from the sun. Every one is aware of the powerful control of solar light over vegetable growth. Healthful growth cannot be made to take place in darkness. In the shade, also, plants are feeble and sickly; it is only in strong light that they are sound and vigorous. But the agent which we commonly term light, as it comes from the sun, is very complex. It contains several different forces, and produces a variety of effects. One of these forces affects the animal eye, and is distinctly the illuminating force; another acts upon the thermometer—it is heat, or the calorific force; still another force exists in the solar beam, known as the actinic or tithonic force, which produces chemical decomposition, such as those of the iodized or chlorinized silver plate in the Daguerreotype process.

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## PROFITS OF FARMING.

We commend the following, which we cut from the *Country Gentleman:*

The statements furnished of the management of four State premium farms serve as a good answer to the hackneyed assertion that farming can never be made profitable, or that 2 or 3 per cent. is all that can be expected from capital invested in land. The farm of N. Hayward & Son, of Brighton, Monroe county, contains 78 acres, 68 of which are "improved." The total expenses are given at $1470, which sum includes 7 per cent. interest on $10,000, estimated value of the farm, that, is about *ten dollars' interest per acre*, besides all taxes, cost of manure, labor, seeds, insurance, and even newspaper subscriptions. The receipts are $2726, making the net profits $1256—that is, $18.48 per acre, after paying all expenses and interest. This is better than bank or railway stock. A few of the principal items of this large amount of profits are the following: Wheat, $403; hay, $406; potatoes, $161; peaches, $460; apples, $162; onions, $314; seed onions, $100; garden and farm seeds, $572, besides many crops of less value. It may be proper to state, that the proprietors of this farm are among the best and most intelligent cultivators of fruit in the State, as the frequent premiums they have drawn from the State Society fully prove.

The farm of McCulloch & Kirtland, of Greenbush, consisting of 130 acres of land, chiefly occupied for dairy purposes, is managed at a cost of $1400

per annum; on which the receipts are $3358, leaving $1948 as net profit, or about $15 per acre, out of which interest is to be paid on the land.

Albert G. Ford's farm in Fairfield, Herkimer county, contains 130 acres, 95 of which are improved land. The manufacture of cheese is the chief business; the yearly cost $926; the whole receipts, including $1200 worth of cheese, and $510 of hay, are $2396, or $1460 net profits. This is a net return of $11 per acre for the whole farm, or $15 per acre for the improved portion.

Now, such statements as these (and we could furnish twenty more not unlike them from our own knowledge) ought to convince all who place the highest net profits on farm investments at 3 per cent., either that they are deficient in abilities, or have never been informed themselves of the best modes of farming; and we advise them to buy at once this volume of transactions, and read over carefully the statements of the admirable management of these premium farms, and see if they cannot make some improvement on their present superficial, skinning, earth-robbing system.

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## VARIETIES OF GRAPES.

Mr. Robert Buchanan, in his recent work on the Grape Culture, gives the following varieties of grapes cultivated in the Cincinnati vineyards, with his views in regard to their relative value:

1. The Catawba is our great wine grape, and stands without a rival. Mr. Longworth has offered five hundred dollars' reward for a better native variety, and several new seedlings have been produced, but its equal has not yet been found. It is subject to rot.

2. Cape; this old favorite of former days is now almost displaced by the Catawba. It is still cultivated in some vineyards, but not extensively—a very hardy variety, and but little affected by the rot.

3. Isabella, a variety much esteemed in some of the Eastern States, particularly about the city of New-York, where it ripens better than here. It is almost abandoned as a wine grape, and generally cultivated only for table use. A hardy variety, subject less to rot than to mildew—in some seasons ripens badly.

4. Bland's Madeira; a delicious table grape, resembling the Catawba in its appearance. Too tender for vineyard culture in this climate. On arbor, in sheltered situations, it bears well.

5. Ohio, or Cigar Box, is a fine table grape, bunches very large and shouldered, berries small, black, sweet, and without pulp; does well on arbors or trellises, but will scarcely answer for the vineyard culture—requires long pruning.

6. Lenoir; a black grape, bunches large and compact, sometimes shouldered, without pulp; berries small, black, sweet and palatable. Subject, in clay soils, to mildew and rot.

7. Missouri; fruit black, bunches loose and of medium size, berries without pulp, sweet and agreeable. Sometimes cultivated in vineyards.

8. Norton's Seedling; bunches of medium size, compact shouldered; berries small, purple, sweet, but with a pulp.

9. Herbemont's Madeira; a good wine and a very pleasant table grape; bunches medium size, berries small, black, and without pulp.

10. Minor's Seedling; a new grape of the Fox family. Fruit: bunches

medium size, berries large, pulpy, musky, and rich-flavored, very hardy; but little subject to rot. This grape will probably be found a valuable variety for the vineyard.

11. White Catawba; a new seedling from the Catawba, but far inferior to the parent. Bunches medium size, shouldered; berries white, large, round, and pulpy; in taste like the Fox Grape.

12. Mammoth Catawba; another new seedling, resembling the Catawba in color, but not so well flavored. Bunches large, shouldered; berries very large, round, pulpy; in some seasons subject to fall off before ripening.

Mr. Longworth, in a letter to the Cincinnati Horticultural Society, remarks: "I have for thirty years experimented on the foreign grape, both for the table and for wine. In the acclimation of plants I do not believe; for the White Sweet Water does not succeed as well with me as it did thirty years since. I obtained a large variety of French grapes from Mr. Loubat, many years since. They were from the vicinity of Paris and Bordeaux. From Madeira I obtained six thousand vines of their best wine grapes. Not one was found worthy of cultivation in this latitude, and were rooted from the vineyards. As a last experiment, I imported seven thousand vines from the mountains of Jura, in the vicinity of Salines, in France. At that point the vine region suddenly ends, and many vines are there cultivated on the north side of the mountain, where the ground is covered with snow the whole winter, from three to four feet deep. Nearly all lived, and embraced about twenty varieties of the most celebrated wine grapes of France. But after a trial of five years, all have been thrown away. I also imported samples of wine made from all the grapes. One variety alone, the celebrated Arbois wine, which partakes slightly of the Champagne character, would compete with our Catawba.

"If we intend cultivating the grape for wine, we must rely on our native grapes, and new varieties raised from their seed. If I could get my lease of life renewed for twenty or thirty years, I would devote my attention to the subject, and I would cross our best native varieties with the best table and wine grapes of Europe. We live in a great age. Discoveries are daily made that confound us, and we know not where we shall stop. We are told of experiments in mesmerism, as wonderful as the grinding-over system would be; but I fear the discovery will not be brought to perfection in time to answer my purpose, and I must leave the subject with the young generation.

"I have heretofore wanted faith in the doctrine of French horticulturists, that to improve your stock of pears, you must not select the seed of the finest fruit, but of the natural choke-pear. I am half converted to their views. The Catawba is clearly derived from the common Fox grape. In raising from its seed, even white ones are produced, but I have not seen one equal to the parent plant; and in all, the white down on the under side of the leaf, and the hairs on the stalk, common to the wild Fox grape, are abundant."

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## REARING TURKEYS.

MESSRS. EDITORS:—H. G. Howe, Esq., of Lawrence, Mass., has just related to me a very interesting surgical operation, which may give a useful hint to the growers of poultry. He has consented I should pass it over to you, to publish or otherwise, as your better judgment may dictate. Last February he had, among a flock of turkeys hatched the preceding September, which he

kept enclosed about his barn, one that for several weeks seemed to become more and more drooping, and destined to die. He caught it, and finding its crop very full and hard, and presuming that he should lose it at any rate, he bound its neck, wings and legs, to keep it from fluttering, and proceeded with a sharp razor to open and lay back the skin of its breast, and then the crop, which he found nearly bursting with *dried hay*, of which he picked out nearly (as he says) enough to fill his hat! and then with a needle and a thread of fine silk carefully sewed up the opening, and kept it for a few days quiet in a warm box, eating lightly of soft bread soaked in milk, when it was allowed to run at large with the rest of the flock. In May succeeding, it weighed 24 pounds, and might with extra feeding have been made to weigh much more. Yours truly, E. SANBORN.

*Andover, Mass., Dec.* 25, 1852.

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## ECONOMY IN HORSE-FLESH.

[WE copy the following admirable article from a late number of the *Farmer's Monthly Visitor*, published at Manchester, N. H., and there is no subject more worthy careful investigation. But there is one paragraph which, although it is endorsed by the learned Editor of *The Working Farmer*, we think most manifestly open to criticism, and we have inserted comments of our own in connection with it.—EDS.]

The natural life of horses is from thirty to forty years. Yet with the advantages of civilization most horses are broken down before they reach fifteen. A few continue to serve enlightened and humane men twenty or twenty-five years. The early decay and multiplied disorders of horses indicate that some great errors are committed in our general education and management of this noble animal. In an economical point of view, this matter is worth looking at. If we could go into minute details, it might undoubtedly be shown that hundreds of thousands of dollars are lost to the people of this State either by neglect or ignorance, or indifference to the care of horses. Our object in this paper is not to discuss this subject, but simply to call attention to it, to direct the thoughts of our agricultural readers to a topic in which they have an immediate interest. Most people are said to be peculiarly sensitive in their pockets, and certainly an intelligent regard to the main chance should induce farmers to study economy in horse-flesh.

One obvious cause is the general ill-treatment of horses during winter. Flesh, strength, health and spirits can be secured only by suitable care, food, warmth and comfort. Cold is a sad consumer of vital power. Dwellers in arctic regions require a large amount of nutritious food. A plentiful meal is of essential service in defending us from the effects of the cold. Yet how many horses are condemned during the winter to coarse meadow-hay, or other poor fodder! How many are unacquainted with the luxury of a blanket and curry-comb! How many sleep on bare planks, and through the day stand shivering in rickety barns or in the open yard! The result is, that in spring they are rough, poor and feeble. It is not only easier but cheaper to keep a horse in good case than to repair his wasted energies and to replace his lost flesh. Is it not bad policy to treat a horse so meanly in winter, that he is incapable of labor in spring? Horses are very tender. They shrink from cold and suffer by it, and regard to their comfort and our interest requires us to keep them warm.

Another cause of their premature decay is too early hard work. A horse

well treated reaches his full growth and strength in about eight years, and from that age till fifteen is in his prime. But most horses are strained, sprained, lamed, or broken down before eight, by untimely applications to hard labor. Light work and moderate exercise strengthen their constitution by increasing the appetite and promoting the general health. Dr. Warren says, that two hours' work every day is abundantly necessary to maintain their vigor and the suppleness of their limbs. Of course when fully grown they can do much more. All this, however, is very different from severe labor upon a youthful frame. In this respect a horse differs in no way from a child. We have all heard of children in England, five or six years old, working in mills fourteen or sixteen hours a day; and if they lived through this early discipline, they became deformed, rickety, stunted and feeble men. Such treatment checks the free development of the system, retards the growth, and prevents the attainment of strength and health. Think of this when you think of your own purse.

Long experience has taught us that health can be maintained (so far as food is concerned) by three meals a day, and that it is promoted when those are taken regularly. A sure method of disordering the stomach and hindering its healthy action is to eat at irregular intervals. A horse has a stomach subject to many of the conditions of our own. Over-feeding, under-feeding and irregular feeding produce in him effects similar to those produced in us by like causes. Stable-keepers understand this, and profit by their knowledge. Why should not farmers? Farmers keep horses for profit. Why not get and save as much as possible? Irregularity in feeding occasions a direct loss of food, and an indirect loss in the impaired health of the horse. A hearty meal morning and night, and a moderate meal at noon, with kind treatment and general good care in other respects, will be sufficient for working horses. The superiority of cut and mixed food is so well understood as to need no argument to recommend it. Thrifty farmers know the value of a hay-cutter.

It is not a matter of indifference how a horse stands in the stable. His legs are of about equal length, and he should therefore have a floor nearly level, that the weight of his body may be uniformly distributed. This arrangement, so obviously required by regard to his health and comfort, is violated by the construction of floors sloping from six to eight inches. The consequence is, that the horse is subjected to a continual strain upon his fore feet, which must in time diminish their power. He knows where the trouble is, and speaks of it as well as he can, by bearing as much of his weight as possible upon his hind toes. He does this to equalize the weight, and to restore the balance lost by the sloping floor. Level floors may be constructed with deep grooves to carry off the water. This should be removed, not only for cleanliness, but because its accumulation in the bedding generates ammonia, which *is said* to be injurious to the sight. Let any of us stand a long time in a position that strains one set of the muscles of the legs, and we can then imagine the effect of a sloping stall upon the horse. Humanity and economy both demand that we should make the horse as comfortable as possible.

[This correspondent, generally so judicious in his remarks, is here manifestly at fault. When the floor is elevated forward, or inclines downward from the rack, it produces an effect precisely opposite that described. The weight of the pressure falls on the lower point supported. To illustrate: if two men hold a ladder by the two ends in a horizontal position, the pressure is alike on both. If one end is raised ten feet, the pressure is proportionably

increased upon the opposite end; if it is raised to an angle of 70 or 80 degrees, a mere boy can sustain the upper end. So, if the spring on one side of a chaise is so weak as to bring the weight lower on that side than on the other, the weaker spring will have the greater portion of the weight to bear, and the mischief is constantly increased. This is too familiar to need comment. Transfer these *facts* to the fore and hind parts of a horse. Or look at a man going up a ladder at an inclination of 70 degrees: he rather *holds on* by his hands than bears weight. But if that ladder were nearly horizontal, and his relative position to the ladder were the same, the ladder only being changed, the man would have partly to support himself by his own arms.

But we have seen a horse standing in a stall with his hind feet elevated above his fore feet, by reason of the non-removal of his own dung; and thus the fore feet are strained, or at least overtasked, and every thing is unnatural and undesirable.—Ed.]

Another cause, and perhaps a chief cause, of the early failure of the horse, is the treatment experienced by his feet. This assertion may sound dogmatical, coming from a person who has no minute knowledge of the anatomy of a horse's foot, and never read a treatise on shoeing. But extensive knowledge is not required to enable us to see and understand some of the evils which ignorance or carelessness inflicts upon a horse's foot. Any body with eyes can see that a horse naturally elevates his fore toes to avoid obstructions. Why should his toe be pressed down and out of its proper position by tight heels to his shoe? Every body knows that the natural tendency of the hoof is to expand. A regard to that fact should prevent excessive narrowing-in of the shoe. The effect is somewhat similar to that occasioned by our wearing tight shoes. I have heard that the best farmers in England drive no nails upon the inside heels of the fore feet; that is, they nail the outside and just round the toe, leaving the inside heel free to expand. We know that three or four weeks will produce a considerable growth of the hoof; and yet shoes sometimes remain on ten or twelve weeks, a struggle between the stiffness of iron and the flexibility of the hoof. We can easily guess which gets the better. We know that the hoof is apt to be cracked if the horse stands upon a dry wooden floor; and yet how seldom does he stand upon any thing else? We know that, owing to the peculiar construction of the foot, shoeing is a delicate operation, requiring skill and the application of enlightened common sense; and yet, until people have suffered severely in their pockets, they rarely make a sufficient scrutiny into the qualifications of their blacksmiths. These things being so, and within the reach of every one's knowledge, may we not be justified in saying that the treatment which the horse's foot receives is a chief cause of his early decay and death? To us as well as to him, his foot is a most important member, and we consult our interest and his comfort by taking the best possible care of it.

It is not necessary to speak of other causes of the shortened lives of horses, such as over-driving, exposure to take cold when heated, too much water when hard driven, deprivation of salt, excessive labor, cruelty, &c. The merciful man is merciful to his beast, and the treatment of the horse in these respects will depend on the general character of the owner. If humane and considerate, he will sympathize with his horse; if unkind and irritable, he will abuse him.

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To Cure Warts.—Dissolve as much common washing soda as the water will take up; wash the warts with this for a minute or two, and let them dry without wiping. This repeated will gradually destroy the largest wart.

## ELECTRO-TELEGRAPHIC DEVELOPMENT.

The extent of telegraphic communication completed and in operation throughout the world at the beginning of the present year may be estimated, as far as can be gathered from the returns, at nearly 40,000 miles. Of this amount there were nearly 4,000 miles in Great Britain, of which 100 miles only were underground, with about 400 or 500 miles in course of construction in England, Scotland, and Ireland, and as many more projected. In America there were 20,000 miles of telegraph completed and in operation, with 10,000 more in process of construction, uniting in one great network the principal cities of the United States, the Atlantic and Pacific Ocean, and the extreme boundaries of that extensive continent. In Europe there were about 11,000 or 12,000 miles of telegraph in operation, and as many more projected or in progress. In Germany there were 3,000 miles completed, in Austria 3,000, and in Prussia between 3,000 and 4,000 miles. France, until lately in the rear of other nations, is now extending her telegraphic lines in all directions, her completed mileage at the present moment being small compared with that of other countries, her principal communications being those between London and Paris, Strasburg, and Marseilles. Russia has just commenced her system of telegraphs between St. Petersburg, Moscow, and Cracow, and the ports on the Baltic and Black Seas. In addition to her existing line between Naples and Gaeta, Italy is continuing the Neapolitan line from Terracina to Rome, so as to connect with the lines of Upper Italy. Denmark has about 400 miles of telegraph; Belgium 500; and the Netherlands line has just been completed from Amsterdam to the Hague. About 4,000 miles are about to be constructed in India. Switzerland is introducing the instantaneous communicator, as well as other continental cities, so that the only unsupplied portions that will soon present themselves on a telegraphic map of the world will be Australia, Africa, and China.—*Advertiser.*

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## NEW PROCESS OF MANUFACTURING WROUGHT IRON DIRECT FROM THE ORE.

One of the most valuable improvements in the manufacture of iron during the last half century has recently been made by Mr. James Renton, of Newark, New-Jersey. For several years he has been engaged in experimenting upon iron ores for the purpose of producing good wrought iron direct from the ore, with mineral coal; and we have been assured by those who have witnessed his experiments that they have been crowned with complete success. At the works of the American Iron Company, at Newark, Mr. Renton's process has been adopted; and we learn from our informant, who had the pleasure of witnessing the operation, that nothing could be more complete and satisfactory. "The ore and its admixture is elevated to the top of a chamber, (situated in the rear end of the furnace,) and placed in close chambers communicating with the furnace. It is then let down in the rear end of the furnace, and subjected to the heat required to burn out the carbon and weld it into a ball; it is then placed under the hammer and made into a bloom, or made to run through the rolls into merchantable iron. During our stay at the works, we saw several balls made, averaging about twenty minutes to each ball, and weighing about seventy pounds to the ball. The process is continuous, and after the furnace

is heated up, a ball is taken out about every twenty minutes. Independent of the saving on cost of manufacturing, which is estimated at about $10 on the ton, over all other modes, the iron is of a uniform good quality, and pronounced by competent judges to be equal to any iron manufactured." The great value of this invention will not fail to be appreciated in other countries, and patents have been secured for the same under nearly all the principal European governments, as well as in our own country.

In regard to this improvement the *Scientific American* remarks:

"The process is founded upon truly scientific principles, and supersedes the necessity of previously melting into pig iron, as the ore can be made immediately into blooms, an advantage which will be immediately appreciated by all interested in the manufacture of iron. We have personally visited the place, and can therefore speak more confidently on the subject. During our stay we saw the operation carried on, and marked the time required for making the iron, which was at the rate of a ton per day of twelve hours—three blooms, of over seventy pounds each, having been made in about an hour. An improvement like this on the old-fashioned slow and expensive process, by which the ore or metal has to undergo two successive exposures in the furnace before it can be made into wrought iron, is a great triumph of American skill. We hasten, therefore, to record the event, and doubt not that other countries, as well as our own, will vie with each other in laying hold of the benefit conferred upon our times by the consequent economy that is now presented to their notice. Any description of fuel—wood or coal, both anthracite and bituminous—can be indifferently employed for heating the furnace, and with nearly equal advantage."

We learn that a company with a capital of $100,000 has been formed, for the purpose of carrying on this manufacture.

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FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

## "QUESTION FOR THE CURIOUS" ANSWERED.

MESSRS. EDITORS:—In the January number of *The Plough, the Loom and the Anvil*, I find "A question for the curious," which is easily explained by natural laws.

When fluids are poured into a funnel, the portion in the centre descends more rapidly than that which lies near the circumference, because it meets with less friction: this causes a conical shape on the surface, in consequence of which new currents are formed from all parts of the circumference to the centre; when these currents meet, the force of the meeting causes a rotary motion, influenced in its direction by the side in which it is poured: if poured to the right, the motion will be to the left, and vice versa.* This motion constantly increases as the cone approaches the cylindrical form, until it becomes

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* If a small funnel be filled with water, and stopped at the bottom with the finger until the fluid is at rest, on removing the finger, the water will flow out without any rotary motion; but if filled as before, and stirred round rapidly, on removing the finger, the cone will be formed almost immediately, and the water will rotate in the direction in which it was stirred, whether right or left.

If the funnel had been a large one, the water would have had sufficient time to have established the rotary motion; but being very small, it all escaped before the motion was communicated to a sufficient number of particles to be perceptible.

I tried these experiments after writing this letter, and therefore add this note.

so great as to overcome the attraction of the particles of fluid for each other, and by centrifugal force a void is left in the centre.

This phenomenon will occur in any shaped vessel which discharges at the bottom. The shape of the outlet has but little effect; a round orifice is more favorable than a square one, because the fluid meets with less resistance; the motion will be retarded by a square orifice, and more by a triangular one.

I should like to have you inquire of wheelwrights why they "tuck" or "gather" wheels, both before and at the bottom, instead of setting them perpendicular on the axle-tree, thereby doing away with the object of "dishing."

After they give their reasons, I should like to give philosophical ones why this universal custom should be abandoned.

Respectfully yours, G. W. VARNUM.

*Wiota, Wis., June* 23, 1853.

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## NEW BOOKS.

*The Illustrated Magazine of Art.* Published on the first day of every month, by ALEXANDER MONTGOMERY, 17 Spruce street, New-York.

Two numbers of this new monthly are on our table. They promise well, containing many articles of substantial merit. The engravings are very numerous and various. A few are coarse, but most of them are excellent, and favorably compare with the very best in similar publications.

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*A Gazetteer of the United States of America, &c.* By JOHN HAYWARD. Hartfo rd Case, Tiffany & Co. 1853. pp. 861.

Here we have a substantial 8vo, containing concise descriptions of the several States, Territories, counties, districts, cities, towns, villages, mountains, valleys, islands, capes, bays, harbors, lakes, rivers, canals, railroads, &c., &c., with occasional incidents of history, and other matters of universal interest. It is the result of long, patient, and successful labor, and in all respects is handsomely and substantially executed. It contains, in an appendix, the details of the population by the last census, and of the post-offices of the United States. This is the only volume in our recollection, of recent date, so extensive in its character, and we know of none which can be accepted as a substitute. It should have a place in every library.

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*The Arts of Tanning and Currying, theoretically and practically considered in all their Details.*—This is a full and comprehensive treatise on the manufacture of the various kinds of leather. It is illustrated by over two hundred engravings, and edited from the French of De Fontenelle and Malapeyère, with numerous emendations and additions, by CAMPBELL MORFIT, Practical and Analytical Chemist. The want of a thorough practical work on this most important branch of American industry has been completely removed by this volume. From its accuracy in science, the nature of the subject, the command of materials enjoyed by the author, the comprehensive character of the information, and the manner in which these means of excellence are treated, this work will be hailed with pleasure by all lovers of industrial progress.

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*Introductory Lessons in Geography.* By G. W. FITCH.—This little educational work is a great boon to the rising generation, in whose education geographical knowledge cannot be neglected, where any pretension is made to keep pace with the intellectual and physical progress of our country and the times. This introductory Geography cannot fail to recommend itself to parents, teachers, and schools, by its simplicity and accuracy of arrangement. It is published by George Savage, 58 Fulton street, New-York.

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## NEW MUSIC.

MESSRS. WM. HALL & SON have recently published the following pleasing and popular songs: "The Old Folks are Gone," "I'll throw myself away," "Fare thee well, Kitty Dear," and "Tilda Horn." These songs are sung by Christie's Minstrels at their "Opera House" in this city, and are constantly encored; and this is sufficient evidence of their popular merit.

## SCIENTIFIC AND MECHANICAL MONTHLY RECORD.

IMPROVEMENT IN THE MANUFACTURE OF IRON AND STEEL.—A Parisian, says the *London Mechanic*, has patented a method of manufacturing malleable iron and steel from decarbonated cast iron, without casting, by heating it in contact with a metallic oxide, or a carbonate containing a sufficient proportion of oxide, and then rolling or hammering it without previous puddling. The cast iron to be converted should be cast in bars or plates, in such a way that the bubbles or impurities may form the end of the bar or plate, and be cut off with the rough end, instead of being distributed over the entire surface; and the bars or plates should also be of such size that, when extended by rolling, they will give the required form of bar or plate to be produced. The substances used for effecting the conversion of the cast iron are protoxide of zinc and calamine; but the oxides of iron, red oxide of manganese, deutoxide of copper, protoxide of tin, or oxides of lead may also be employed. The protoxide of zinc, calamine, and the oxides of iron, when not too large a proportion of silica therein, are the most suitable. The quantities of oxide employed will vary with the degree of decarbonization to be effected. The cast-iron bars or plates to be converted, having been placed along with a proper quantity of the particular oxide employed in a cementing case, are raised to a cherry-red heat in a suitable furnace, and kept at this heat till the process is completed. The rate at which the process proceeds is one third of a line from each surface in 24 hours. For making steel, a less quantity of oxide is used, or the process continued for a less time. The metal is then extended by rolling, and the rough ends cut off. It is then fit for market.

MACHINE FOR CRIMPING IRON BARS.—We understand that Messrs. Slocum & Sayles, Lansingburg, Rensselaer Co., N. Y., have patented a machine for bending bars of iron into zig zag shapes, for ornamental purposes, housework, &c. The rolling-mill employed for this purpose consists of two under rollers placed side by side, and of two upper rollers running in bearings which can slide up and down in the framing, so as to recede from or advance to the under rollers. Between these two sets of rollers there slides a bed, which carries the dies intended to impress the desired form on the iron. These dies are formed in pairs, so that the projections of the upper die fit into the recesses of the lower one. Their shape is in general angular, and the upper die is so formed with joints that each angular piece can be forced into its corresponding cavity in the lower die, without the necessity of its fellow projections partaking of the motion. The bar of iron being placed between the dies, which are fixed on a movable table, a chain is attached from the table to the lower rollers, so that the former may be drawn along as the rollers revolve. The upper rollers, which give the pressure, are forced down to their work by weighted levers. Hence, when the machine is set in motion, the table and dies are drawn between the rollers, and the first jointed projection of the top die is forced into its recess in the lower die, thus giving the iron bar the desired shape. The table, continuing to advance, is caught between the second pair of rollers, which hold the bar from shifting whilst the second projection is descending; and in this manner the process goes on, till the whole length of the bar is fashioned.

MANUFACTURE OF PAPER.—Messrs. J. H. Brown and J. Mackintosh, Scotland, have patented an invention which consists in using hollow moulds, composed of perforated metal, wire, or other suitable material, and covered with felt, within which, after their immersion in a vat of pulp, a partial vacuum is created, so as to cause the pulp to adhere to or be deposited on the felt surface in a layer of uniform thickness. This process is applicable to the manufacture of sheets of paper and various articles, such as envelopes, bags, cases, &c. The articles, after having been formed, are subjected to a drying process, and to pressure where their form will admit of it.

LOVER'S SYPHON.—W. Lover, a Dublin surgeon, has invented an ingenious syphon, which promises to be useful for philosophical purposes. It consists in adding an elastic bag to the longer leg of the instrument, communicating freely with it a little above the extremity. When intended for use, the air is to be expelled from the bag by pressing it with one hand, and the end of the tube close to it is to be shut by a finger of the other, if there be no cock upon it. Upon plunging the shorter leg of the instrument into the fluid to be drawn off, and releasing the bag without removing the finger from the end of the tube, the partial vacuum which will be created within it will raise the fluid over the bend of the tube, and fill the longer leg. It will then only be

necessary to remove the finger, or to open the cock, to set the syphon in action. This is evidently a convenient means of filling the instrument, far preferable to suction, or to pouring fluid into it beforehand.

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Steam Power in the U. S.—It is given in a table of statistics of the number of steam-engines and locomotives produced in a year, at the different establishments, that the steam power created in a year in this country is equal to 713,118 horses; which is equal to the physical labor, at the present time, of 7,154,390 men, and, in the fourteenth century, of 357,626,730 men.

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Telegraph between Europe and America.—The Londoners have revived the idea of connecting their country with ours by telegraph. The proposition is, to extend the line from the Orkney, Shetland, and Feroe Islands to Iceland, and thence to Greenland; across Davis's Straits, to Labrador and Quebec. The entire length would be 2,500 miles, and the submarine portions about 1,500. From the Shetland Islands it is proposed to carry a branch to Norway, connecting it there with a line to Stockholm, Gottenburg, and Copenhagen. From Sweden, a line may easily cross the Gulf of Bothnia to St. Petersburg. The whole expense is estimated below £500,000. We are glad also to see a movement in our country in favor of a subterranean telegraph to the Pacific. From thence it may be carried to Behring's Straits, Kamschatka, join the Russo-American line, and encircle the world.

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Manufacture of Lenses.—In the Repertory of Sciences and Inventions, London, is the report of an invention by A. V. Newton, which promises to render more efficient lights on ferries, vessels, light-houses, locomotives, wheel-houses of ships, &c. The dioptric lens, heretofore in use, for sea-lights, or other lights requiring great intensity, being constructed of single zones or rings, made up of segments according to the diameter of the required lens, has induced a belief that glass could not be prepared without incurring the expense of grinding and polishing the curved surface, and that economy dictated a method of manufacture embracing a centre and zones or segments. The inventor was induced to examine the method of the construction of the built-up lens, to try and reduce the expense without diminishing the strength of the light. Commencing with the suggestions of Buffon, that a spherical body, from its thickness, absorbs light according to its density, and that a section al figure of any required shape and thickness could be cast of glass and ground in concentric cones, to produce a lens, as partially accomplished by Abbé Rochon, who prepared the way for the manufacture of the dioptric lens in separate pieces by the ingenious Fresnel, termed "the annular band lens," which is now used in our best light-houses. These lenses are very expensive, for each separate piece must not only have its surfaces formed with great accuracy, but all the separate pieces must be arranged to each other, so that when put together they shall form a perfect whole. This invention is to produce a dioptric lens which shall present all the practical advantages of Fresnel's annular band lens, at so cheap a rate as to admit of its being applied to all purposes requiring intensity of light. The inventor makes dioptric lenses in one or several pieces, moulded and pressed into the form required for the surfaces; and when made in several pieces, the required fit of the several parts is produced by giving the reversed required form to metal moulds in which the molten glass is to be run and pressed. To promote focal intensity and prevent the absorption of light, each lens is manufactured as thin as the size and number of concavities and convexities will permit.

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New Air-tight Oven.—Benjamin Barstow, of this city, has taken measures to secure a patent for an improved baking apparatus. It consists in arranging within an air-tight outer casing, one or more ovens over the furnace chamber, in such a manner that when the fire is in full blast the rising flame or hot air will be allowed to have a free course and circulate underneath the bottom, over the top, and along the sides and ends of the ovens. This is effected by means of passages in the top plate of the furnace through which the hot air and flame passes, and circulates freely, as described, to the ovens, the bottom plates of which are similarly provided with passages for the admission of the hot air and flame. Dampers are likewise affixed to the passages of both the ovens and the furnace, so that the quantity of heat can be regulated at will, and they can be so operated as to let on the flame to the ovens in a ziz-zag manner instead of in a direct line. This arrangement is useful in case the heat is too great on one side and not sufficient on the other. The ovens, which are placed in a row, one above the other, may be indefinite as to number, and are separated from each other and the outer wall by partitions and metal rods. These latter, which extend completely across the under sides of the ovens, serve to support them, and have their bearing in the wall.

There is also an independent arrangement of pipes, by employing which any number of ovens can be heated, either for bread baking or meat cooking.

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New Printing Machine. — The *Pittsfield* (Illinois) *Press* describes a new rotary printing press, which may be of interest and profit to the "craft" to notice. It says the machine is extremely simple, consisting of a perpendicular wheel, upon the side of which the form is placed, with conical cylinders upon which the paper runs, and against which the type makes the impression on the paper. As the wheel or "bed" revolves, the form is passed under inking rollers, then under the impressing cylinders, and the operation is finished. With a single cylinder, a medium or imperial sheet can be worked as fast as the paper can be "fed," and, with a double cylinder, the press will of course make a double impression with equal celerity. The press is susceptible of enlargement and increase in the number of cylinders *ad libitum*. But the most important feature in the invention is its adaptation to small newspapers and job printing. In the latter it is almost invaluable. We have, with a very rude *pine* model, worked off 1,500 bills per hour. The impression was, of course, inferior; but that was incidental to the very rude construction and material of the machine.

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Improved Roofing.—J. McMurtry, Lexington, Ky., has taken measures to secure a patent for roofing made with planks, which are grooved with the upper lip narrower than the lower, to admit the projection of a T-shaped plank called a capping-piece, by which the lower planks are secured in their place and kept water-tight. To drain off water absorbed by capillary attraction about the centre joints or in crevices of the roof, the lower planking is concave, and the under side of the capping-piece is similary shaped, so that a complete drainage is acquired by means of these gutters.

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Separating Certain Metals. — Alex. Parkes, of England, has patented a process for the separation of gold from compounds of lead containing that metal. The gold or auriferous earth is first smelted with lead and the usual fluxes, and the compound resulting from this operation is melted with the addition of one per cent., or 22 lbs. 4 oz. of zinc to every ton thereof containing 10 oz. of gold. This proportion will be increased with that of the gold present. The zinc is added when the compound is in a melted state, and at about the melting temperature of zinc; and after stirring, so as to insure the gold being all taken up, the mixture is allowed to cool, the zinc and gold in combination are removed, and the gold separated by removing the zinc by means of acid, or by distillation with carbon. The next process is applicable to the separation of gold and silver from mixtures containing the same, and consists in employing for that purpose a metal or compound fusible at a lower temperature than the compound operated on. The process is somewhat similar to that of amalgamation, where mercury is employed, only that, as the patentee uses metals not naturally fluid, he is compelled to apply heat during the process to secure the necessary degree of fluidity. The metallic compounds treated are reduced to a fine powder, and mixed with from ten to thirty per cent. of lead or zinc, and five per cent. of chloride of ammonium or chloride of zinc, or one per cent. of carbon, (which may be used without the salts named.) They are then placed in an iron barrel or other convenient vessel heated by a furnace, and set in motion for from five to ten hours, at the expiration of which time the amalgamation of the precious metals will have been effected. Then, by washing or other means, the amalgamated mass is separated from the earthy particles, and treated by cupellation or other means, in order to obtain the gold or silver in a metallic form.

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Sewing Machines. — These ingenious savers of labor seem to be on the increase. Dr. Otis Avery's is, we believe, the latest. It is about the size of a lady's work-box, portable and convenient, and stitches shirt-bosoms, vests, and what not, in a very superior manner. We have on former occasions chronicled those sewing machines patented by Howe, Singer, Maguin, Morey, and Johnson & Wilson. For cheapness, household use and simplicity, Avery's promises to be the more popular.

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New Description of Umbrella.—H. Richardson and Bennett C. Perry, Conn., have taken measures to secure a patent for an arrangement to enable an umbrella to be folded into so small a compass that it can be placed in the pocket or packed conveniently for travelling. The stick forms several pieces, which screw together, and, by means of shoulders, are maintained in a steady position. A small link and swivel prevent the several pieces from becoming detached when the joints are unfastened, and yet do not check the action of the screws. Each rib is jointed, and is kept in a proper position by a spring and catch,

which easily yield when the umbrella is required to be folded.

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MACHINERY FOR WINDING YARNS AND THREADS.— Thomas Wallis, Manchester, Eng., has patented an improved apparatus for winding yarns and threads, and also improvements in looms for weaving. The apparatus for winding, &c., includes several arrangements for winding on to flanged and unflanged bobbins, and for the forming of pin-cops. The improvements in looms relate to the small-ware loom, and include arrangements for governing the letting of the warps, for actuating the healds, for working the sets of shuttles, and for taking up the finished goods.

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## AGRICULTURAL RECORD.

PEAT CHARCOAL AS A DEODORIZER.—The English papers mention a method by which the offensiveness of drains and sewers is rendered perfectly harmless, through the wonderful effects of the filtration of the drainage through a peat charcoal tank. Not only is all the poisonous effluvium arising from drains and sewers perfectly deodorized, but the drainage, when mixed with the charcoal, becomes a most valuable manure, *and pure water is drunk from it!* The apparatus consists of a brick tank, sunk in the ground, at the level of the outlet of the sewer, containing a bed of peat charcoal, about two feet in thickness, through which the sewerage passes off, perfectly inodorous, leaving the ammonia, phosphates, and volatile salts with the charcoal. The peat charcoal is also in its dry state the most perfect preservative of all animal and vegetable substances. This experimental discovery promises to be a fruitful one in sanitary movements, as it is an economical, easily applied, and powerful disinfectant, equally applicable to farms, factories, hospitals, and important as an immediate deodorizer of the bad effects of bilge water, &c., &c., on board of ships.

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LIME IN AGRICULTURE.—Mr. Nesbit, of the Agricultural College of Kensington, England, says that pure limestone consists of 22 parts carbonic acid and 28 of lime. When the limestone is heated in the furnace, the carbonic is driven off and pure lime is left behind, if the limestone is pure. Lime that is not pure he considers best adapted for agricultural purposes. Those varieties that have in them phosphate of lime are most valuable; and those which contain silica in a soluble state, sulphate of lime, and gypsum, are also valuable, as they convey to the soil other constituents besides calcareous matter. He says lime can be used beneficially upon soils which have been little stirred, little exposed to the air; upon soils containing organic matter; upon new soils, or upon heavy clay soils. If used without manure upon arable soils from which crop after crop has been taken, *lime will not restore fertility.* Mr. Nesbit is in favor of applying lime in *small quantities frequently*, rather than large quantities at long intervals.

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NEW REAPING MACHINE.—The latest, and probably the simplest, reaping machine brought before the public is that of a Mr. Smith, of Brooklyn, N. Y. It consists of four scythes with three cradle-frames fastened to the rim of a cylinder, having a vertical or rotary motion. The scythes are so arranged that every revolution of the cylinder, simultaneously with the stroke, cuts and lodges the grain in a standing gravel inside the cylinder or drum, whence those who hold the machine can conveniently bend and dispose of the bundles of grain. This mode of gathering the grain wholly dispenses with raking. The grain is cut by the same kind of a stroke as is made with a hand-cradle. The machine can be worked by one horse, and cut twenty-five acres of grain in a day.

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NEW-YORK APPETITE.—From a statement in the daily press, it seems the people of this city devoured, during the year 1852, one hundred and five thousand bullocks, five thousand six hundred calves, three hundred and twenty-three thousand sheep. For these we paid five and a half million of dollars.

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ENGLISH AGRICULTURAL IMPLEMENTS.—At the last annual Smithfield Club Show, London, we find some of the undermentioned implements particularly noticed: THE NORTHUMBERLAND CLOD CRUSHER had claimed for it, that it reduced the land to fine tilth, did not clog in damp weather, left no small clods, did not cut the weeds, but left them to be raked off afterwards; gave to light land the degree of solidity required, fastened the young wheat after frost, and

admirably prepared the ground for grass and clover seeds.

Universal Grain Mill for Splitting Beans, kibbling oats, and grinding barley, attracted attention. This machine has two plates, and the roller is cut both ways; so that by placing grain, large or small, into the proper compartment of the hoppers, and turning the fly-wheel, it will perform either operation without frequent adjustment.

The Companion Subsoil Plough is said to accomplish two important objects simultaneously. It performs the act of ordinary ploughing, it performs the operation of subsoiling, by means of a forward share attached to the beam, and following immediately in the horses' track, which breaks up and pulverizes without turning over the soil that has been pressed by the horses' feet; thereby rendering it fit to receive the earth, which is cut and thrown over upon it by the breast, or turn-furrow.

Cottam and Halben's Improved Draining Level was praised, as it indicates on its quadrantal arc the rise and fall in inches of every three feet in length between the spot where it is planted and that where the drain is to be brought out. The top bar of the level is brought horizontal, by placing the zero on the quadrant opposite to the brass pointer. The instrument must then be firmly fixed in the ground, to the depth of the stops, and adjusted perfectly upright by means of the plumb-line. A person is sent forward to the place where the drain is to be brought out, or in the direction of it, with a stick of the exact height of the sights in the level, which he fixes upright in the ground. The operation is then completed by looking through the eye-hole in the level, and raising or depressing the end which carries the cross wires, till they appear to cut the top of the stick.

Odometer, or Land Measure, is another article exhibited. It is said to be capable of measuring up to 20,000 yards, or nearly 11¼ miles, without being reset. The travelling wheel has six spokes, which divide the circumference into feet, so that should the instrument stop at any point when the square spoke does not come between the handles, the number of feet towards the next two yards may be ascertained.

The Broad-cast Manure Distributor is an article recently registered, and has received a prize from the Royal Agricultural Society at Lewis. Its intention is that of distributing regularly all kinds of natural and artificial manures, even the most difficult ones used as top-dressing, such as nitrate of soda, salt, guano, and soot. The manure is delivered from the box by means of a barrel of novel construction, consisting of a shaft fitted with prongs, which carry over the manure, and in doing so, comes in contact with a series of scrapers which rise with and clean the barrel as it rotates, without the aid of brushes, sweepers, or any other perishable material; from whence it passes down the shoot or conductor, and is evenly distributed all over the surface, or in three or more rows. The shoots or conductors are furnished with wire rods, fixed in alternate lines, giving them the effect of a sieve, whereby the manure is separated and pulverized as it falls.

The Patent British Reaping and Mowing Machine received its due modicum of approbation. By its arrangement the corn, as it is cut, is received on a self-acting travelling apparatus, and by a cradle at the side of the machine it is divided and laid upon the ground, quite out of the returning track of the horses. The whole of the receiving and delivering apparatus may be removed in a few minutes, and the machine may then be used to cut green crops. It is made entirely of wrought iron; its construction and principle is simple, and is not liable to get out of repair. It is worked by two horses, and a boy to sit on the machine to drive. In cutting clover, grass, &c., the back part or delivering apparatus is taken away, leaving only the knives; the knife-bar is then lowered so as to cut closer to the ground, and the machine is immediately in motion. It passes under the crop, cutting it and clearing it over the knife-bar in almost the same position as it was.

Coleman's Patent Expanding Harrow attracted much attention from its fewness of parts and multiplicity of accomplishment. It at once combines a wide or narrow, coarse or fine harrow, either of which may be obtained in an instant, at the will of the workman, simply by altering the place of the hooks in the two longest chains, thus obviating the necessity of a variety of harrows. Being constructed on the principle of a parallel ruler, the lines always retain their relative distances from each other with mathematical exactness, at whatever width the implement is worked.

Chandler's New Chaff-Cutting Machine is said to have stood high in reputation. It is described as doing the same amount of work with much less power than machines of the same kind. From the form of the toothed rollers, choking in the feed is obviated. This machine has also a useful appendage for sharpening the knives, by merely turning two screws, and giving the fly-wheel a few turns backwards.

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Social Life among Animals.—We read that horses and oxen, when deprived of companions of their own species, will asso-

ciate together quite friendly. A dog and an ox, a dog and a cow, when placed in certain circumstances, acquire a strong affection for each other. A single horse confined in an inclosure, discovers every mark of unhappiness. Oxen and cows will not fatten in the finest pastures, if they are deprived of society.

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How to Make Manure.—The Massachusetts Agricultural Society's Report gives the following statement from a farmer of Hampshire County of that State: "Immediately after planting in the spring, and after I have used what manure I want, I commence my compost heap for the next season. Into a convenient place, which with me is a hollow in the angle of a bank wall on the south end of my buildings, I deposit first a load of horse manure. Over this I usually spread the scrapings of my wood-yard and cellar, especially in May, and all other substances that will make manure that I find about my buildings, such as the rakings of the yard, old leaves, &c., making in all another small load. Over this I add a load of loam, then over the whole I spread about a bushel of ashes. For the next three or four weeks this heap receives from the wash-room all the soap suds and washing water, and from the house all the useless slops and washings of the kitchen, sweepings, &c., being kept continually moist. In about four weeks after the first deposit, I add another load of horse manure, more loam and sand from the washings of road drains spread over the horse manure, and over all a layer of wood ashes, occasionally adding more during the next four weeks. This heap, for the succeeding four weeks, receives as before all the fertilizing substances that accumulate in the wash-room and kitchen. This process is continued during the summer and fall, until snow covers the ground, and then I call my heap finished, only as it continues to receive, during the winter, washings, slops, &c.

"I claim for this manure the following advantages: First, it is cheap. Horse manure *alone* is a miserable fertilizer, and this, excepting the wood ashes, is the only substance of any value that enters into the composition. Combined in the way stated, it helps to form a valuable manure. Again, as a matter of cleanness and convenience, this compost heap is of great advantage. How often do we see about farm houses and farm yards accumulations of substances rendering the premises filthy and unsightly. The compost heap receives all these otherwise useless accumulations."

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Feed for Animals.—A correspondent of the *Granite Farmer*, in discoursing upon pigs, thus gives the philosophy of feed: Chemists all agree that the starch of grain is held in little hard sacks or skins, and the stomachs of animals do not open all of these sacks; consequently a portion of nutriment passes off with the excrement and is wasted. This is proved by examining the excrement of animals fed on raw meal. Boiling, or fermentation, will open these little grains and let out the starch, to be deposited as fast as it passes along the various organs of the system.

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McCormick's Reaping Machine.—President Fillmore announces in a letter to the inventor, that a Council Medal has been awarded by a jury of the Royal Commissioners of the World's Fair for his Reaper.

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Flax.—A chemist in Scotland has taken out a patent for improvements in the treatment and preparation of flax or other fibrous substances, and the application of some of the products to certain purposes. The invention is said to consist of a mode of treating the flax, hemp, or other substance, by saturation with steam or hot water, so as to separate the fibres from each other, and to obtain the extractive matter in a state fit to be *used for feeding cattle or for manure.*

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Preservation of Grapes.—We find the following translation of an article in a German paper, in the *Agricultor*, which contains an account of the preservation of grapes in Russia: A traveller who lived at St. Petersburg during the winter season states that he ate there the freshest and most beautiful grapes he had ever seen. To preserve them they should be cut before being entirely ripe. Do not handle the berries; reject all damaged ones, then lay the grapes in a large stone jar holding about thirty gallons. The mouth should be narrow so that the grapes will not touch each other. Fill the spaces between them with millet. Cover closely with a stone cover well fitted and cemented. Over this paste a thick paper, and let it be hermetically sealed so as entirely to exclude the air. In this air-tight jar the grapes ripen fully, and acquire a flavor seldom attained by any other method, and are preserved for two years in the best condition.

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Rhubarb, or Pie-Plant.—A Mr. Cahoon, of Kenosha, Wis., has raised a specimen of pie-plant, the leaf of one of the stalks of which measures three feet one inch across by three feet long, exclusive of the stem, which is thirteen inches long by seven in circumference. Another stem was about one and a half feet long by six inches in circumference.

## EDITORS' JOTTINGS, ETC.

BANVARD'S PANORAMA OF JERUSALEM AND THE HOLY LAND.—By the courtesy of Mr. Banvard, we have had an opportunity to witness this very excellent exhibition. To say that the painting is one of great artistic merit, is only to repeat what every body has already learned. But we think he has shown great wisdom in his selection of localities. There is not one scene presented which is void of interest in itself, and often beauty of scenery combines with mental associations of great power.

The view on approaching the Jordan is one of remarkable beauty. In fact, the whole journey from the Jordan to and through Jerusalem, affords no convenient opportunity for suffering the thoughts to wander, or for giving rest to weary eyes. Why may we not have season tickets to this and similar places of entertainment? Repeated visits are necessary to give permanence and distinctness to our recollections of them, and, as a mere matter of history and geography, this is of no small account.

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MUSIC IN NEW-YORK.—We have had the flood-tide of music for the whole winter, having been favored with the continued presence both of Mesdames Alboni and Sontag. Both have appeared, not only in the concert, but in the Opera.

MADAME ALBONI'S powers as a wonderful vocalist have not been overrated. She is strong in her lofty position, and need fear no hostile attack. We have heard her but once in opera, and therefore are not fully prepared to describe her abilities in that particular department. Her portly dimensions, and the quietude of spirit usually attendant on corpulency, are not peculiarly favorable to dramatic power. But Madame Alboni continues to receive, in this department, the same favorable regard which greeted her in the concert-room.

MADAME SONTAG has continued her series of operas without interruption, and she has certainly not lost, in any degree, her hold on the music-loving portion of this community. While she is the greatest soprano we have heard, excelling in all kinds of style, though in some she is more *wonderful* than in others, she is also a charming actor. Of this, full and even crowded houses twice a week for ten or twelve successive weeks, at $1 and $2 a ticket, are ample evidence. The more frequently we hear this lady, the more we are delighted. She charms us by her elegance of person and of manner, as well as by her sweetness and skill in song. There is nothing about her to regret, but all is pleasurable. She will find it as difficult to tire out her New-York audiences as Handel did to play the congregation out of the church after service.

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PAUL JULIEN.—That wonderful violinist has given us his farewell concert, and goes to England; and that concert was a *bumper*. Of all the prodigies of the age, we have never seen one to compare with him. He handles the bow of an old *master*—not in the Yankee, but the technical sense of the term. No greater or more universal favorite, probably, has ever appeared before a New-York audience.

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When music of the high order which we have so often described shall be accessible to the masses in all our cities and towns and villages, what a glorious revolution shall we witness among the people in the cultivation of taste and of manners! Refined music, in one sense at least, is a "means of grace," and among all the instrumentalities employed, we know of none practically more efficient in softening and subduing the hard, rough features, physical, and mental, and moral, of the large majority of the working classes. True, it is weak as a single instrument, but in its place among the other and, in some respects, mightier forces which act on human character, none is more efficient in bringing out the delicate, the refined, the beautiful, whether in mind or manner, than the higher exhibitions of this delightful art.

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PACIFIC RAILROAD.—The grandest scheme even of this grand age is that of connecting the Pacific and Atlantic shores by a railroad through the entire breadth of this country. What a glorious vista it opens up of "internal improvements" through the valley of the Mississippi: the busy villages and cities that would arise along its route; the hum of industry and the buzz of voices, where now are silent forests, empty valleys, and inaccessible mountains; the gladdened earth giving forth golden grains, exquisite fruits, and noble cattle! The imagination can scarce conceive of the progress such a highway would give our country in twenty years. The cities of the Atlantic will be the depots of the vast wealth of the interior; while the riches of China, Hindostan and Japan will be transferable

only through our country and to our profit. We are midway between Europe and Asia. The Sandwich Islands offer a most convenient stopping-place half way across the vast desert of waters between the Asiatic and American continents, and are therefore natural depots in assisting to develop America's commercial resources. Present appearances indicate that our country is destined to arrive at such a state of national grandeur as will throw the fabled magnificence of the mightiest nations of antiquity, and the highest rank and state attained by the modern empires of Europe and Asia, entirely into the shade. And in America's industrial and commercial prosperity, the whole world will reap a benefit

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A Rat Story.—A writer describing a voyage, in the *Sailor's Magazine*, says: We had many rats about the ship, and more than one nest under the tarpaulin which covered the eyes of the rigging above the tops. One Sabbath morning, when we were all collected in the cabin for religious worship, and in the time of prayer, (moved I presume by the change of climate, for we were now approaching the Cape of Good Hope,) an old gray rat, as if she knew precisely at what time she best could venture, came down out of the maintop, in sight of the helmsman, entered the front cabin door, passed through among us undisturbed, and unfearing, clear into the storeroom aft; with six young rats hanging to her. She was seen by nearly the whole ship's company, who chose not to disturb the exercises, but next day she was found with her young, snugly stowed away among the stores, and cast into the sea.

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Cravats.—Prof. Hamilton made some very forcible remarks lately, at the Buffalo Medical College, on asphyxia, and particularly that form caused by wearing tight cravats, which may interest our readers. Cravats, he said, were first worn by the Croats, in the 16th century, as a part of their military dress. Public speakers, members of Congress and clergymen hang themselves by wearing cravats and stocks high and tight, thereby impeding the return of blood from the head. This can be explained on physiological principles. The brain, in speaking, is excited to increased action, a larger quantity of blood is sent to it, and unless it can find a ready return, produces congestion and apoplexy. Students are not altogether free from these effects. It is surprising how little pressure is necessary to prevent the ready flow of blood from the head. Those who bend their heads forward, as in writing or studying, are apt to feel a dizziness and heaviness in the head, which loosening their cravats or collars altogether relieves, and the mind returns to its original clearness. In clergymen, who are particularly prone to bundle their necks with large cravats, bronchitis is induced, and the vocal chords become relaxed as the consequence.

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## List of Patents, &c., Issued Feb., 1853.

John Bell, Harlem, N. Y.—Improvements in joining corners of Boxes, &c.

James Black and Orson Beecher, Philadelphia, Pa.—Improvements in working the Condenser attached to Steam Diaphragm Pumps.

Charles Bourgard, New-York, N. Y.—Improvement in manufacture of Wigs.

Henry Bretney, Springfield, O.—Improvement in tanning Hides and Skins.

Freeman Palmer, Conneaut, O.—Improved feed-motion in Sewing Machines.

Samuel M. Perkins, Springfield, Pa.—Improved manufacture of Seamless Felt Wearing Apparel, &c.

W. H. Lazelle, assignor to Henry F. Wilson, of New-York city, and S. E. Fenwick, Washington, D. C.—Improvement in machines for Paring Apples.

Joseph Piffant, New-Orleans, La.—Improvement in the frames of Piano-Fortes.

Joseph W. Archibald, Porto Rico, West Indies, Assignor to Horace Southmayd, New-York city.—Improvement in Sugar-draining Machines.

Abiathar F. Potter, Boston, Mass.—Improved Gold Washer and Amalgamator.

Thomas Prosser, of New-York city.—Improvement in Expanding Drills.

Peter Taltavull, Washington, D. C.—Improvement in Omnibus Registers.

Augustus B. Childs, Rochester, N. Y.—Improvement in Grain-Winnowers.

Charles B. Hutchinson, Waterloo, N. Y.—Improvement in machinery for cutting Barrel Heads.

Elijah F. Parker, Proctorsville, Vt.—Improved Frames for Lanterns.

George B. Read, New-York city.—Improved Screw Wrench.

William and Mathias Stratton, Philadelphia, Pa.—Improvement in Portable Gas Apparatus.

Benjamin Shiverick, North Sandwich, Mass.—Improved mode of Feeding Resin in the fires of Glass Substances.

Richard Solis, New-Brunswick, N. J.—Improved manufacture of India Rubber.

Isaac L. Pulvermarcher, Breslau, Prussia.—Improved Voltaic Batteries and Apparatus for Medical and other purposes.

J. B. Moiner and P. H. Boutigney, Paris, France.—New method of manufacturing Candles, Tapers, and articles for burning.

N. A. Boynton, Boston, Mass.—Improved Hot Air Furnaces.

George Chase, Prudence Island, R. I.—Improved

Centre-Board and Rudder for Shoal-water Vessels.

John Filson, Milroy, Pa.—Improved Hanging Farm Gates.

George Peacock, West Troy, N. Y.—Improved Core-Bars for casting Pipes.

Charles Peters, Trenton, N. J.—Improved Moulds for uniting Steel to Cast Iron.

G. F. S. Zimmerman, Charleston, Va.—Improved Winnowing Machine.

E. R. Hallam, New-Haven, Ct., and T. B. Barnard, of New-York, Assignors to E. R. Hallam, New-Haven, Ct.—Improved Gas Meters.

H. Le Riemondie, New-Orleans, La.—Improved Surgical Instruments for the Ear.

Horatio Allen and D. G. Wells, New-York city.—Improved Adjustable Cut-off Gearing for Puppet-valve Engines.

John Briggs, Boston, Mass.—Improved Railroad Car Seats.

Darius C. Brown, Lowell, Mass.—Improvement in Machines for manufacturing Harness for Looms.

Joshua C. Carey, Richmond, Va.—Improved Adjustable Heading Lever in Spike Machines.

Richard M. Leslie, Philadelphia, Penn.—Improvement in Paging Books.

Louis F. Sheppard, Alhambra, Ill.—Improvement in Artificial Teeth.

Rand. B. White, Meriden, N. Y.—Improved Saw-setting Machine.

David and Herman Wolfe, Lebanon, Pa.—Improvement in Seed Planters.

## DESIGNS.

Sherman S. Jewitt and Francis H. Root, Buffalo, N. Y.—Design for a Cooking Stove.

Joseph G. Lamb, Cincinnati, O., Assignor to Alexander Bradley, Pa.—Design for a Cooking Stove.

Joseph Pratt, Assignor to Bowers, Pratt & Co., of Boston, Mass.—Design for a Cooking Stove.

Charles Waterman, Meridan, Ct.—Design for a Sewing Bird.

## RE-ISSUES.

Nehemiah Hodge, North Adams, Mass.—Improved Apparatus for Discharging Water from the Holds of Vessels.

Ed. Hamilton, Bridgeport, Ct., Assignor to H. B. Goodyear, same place.—Improvement in Excluding Dust from Railroad Cas.

## MPROVEMENTS CLAIMED.

Separating Ores or other Substances—By Hezekiah Bradford and Elisha Fitzgerald, of New-York city: We claim giving to the reciprocating pan the peculiar motion described, by the means described.

Also, giving the back movement to the said pan, in a less period of time than the forward movement, by means of a crank or cranks, whose axis of motion is below or above the plane of motion of the rear end of said pan, or by equivalent means, as described, and for the purpose specified.

Also, in combination with a pan, having the motions, or either of the motions, substantially such as specified, and on which the ore, &c., mixed in water, is supplied at some point towards the middle or back, the employment of a current or currents of water descending the inclined or curved surface of the said pan, as specified.

Also, making the rear end of the said pan with an inclination or curve upwards, as set forth.

Also, making the said pan, as specified, with apertures back of the place where the substances to be separated are applied, for the purpose set forth.

Finally, making the front and rear ends, or either, of the pan having a vibratory motion, with a gradual curve downwards, as specified, when the same is employed in combination with currents of water, as specified.

Gas Meters—By A. A. Croll, of London, Eng.: I claim the mode of arranging movable partitions, or plates, so that the flexible material at the circumference of the plates shall not be bent but in one direction, as set forth.

Also, the arrangement and combination of the arms, with the valves and movable plates, of a dry meter, as set forth.

Sewing Machines—By W. A. Johnson, of Greenville, Mass., (assignor to W. G. Bates, of Westfield, Mass.:) I claim the making of the double loop stitch, having the loops upon one side of the cloth, by means of two needles combined and operating as described.

Also, the making a seam, or uniting two pieces of cloth, by means of the double loop stitch, consisting of a plain stitch from a single thread on one side, and on the other, of a continuous chain, formed of a succession of double loops from the threads.

Scythe Fastenings—By Alpheus Kimball, of Fitchburgh, Mass.: I claim the method of securing the blade of the scythe to the snath, by passing its shank through the end of the stationary metal cap, and securing it by means of the upward pressure of the screw, in combination with the claw and bush-piece, constructed and operating as described.

Suspending, Lowering, and Liberating Ships' Boats—By Wm. S. Lacon, of Great Yarmouth, Eng. Patented in England, Feb. 23, 1852: I do not confine myself to the precise arrangement of apparatus described for carrying out my invention; but I claim suspending ships' boats by having the chains or ropes so connected with drums or barrels, substantially as specified, that the two ends of the boat shall descend together, and with equal or nearly equal velocity, and so that the chains or ropes shall be free to disengage themselves from the barrels, in combination with the mode of controlling the turning of the barrels, by the weight of the boat, &c., as specified.

Mortising Machines—By James Moreland, of Adrian, Mich.: I claim the combination of the cross bar on the cross head, with the projecting dog on the movable way, for the purpose of withdrawing the chisel from the wood, on the back motion of the cross head, as set forth.

Cut-off Motion for Looms—By A. B. Taylor, of Mystic, Conn., and Stephen Wilson, Jr., of Westerly, R. I.: We do not claim the roller against the warp, by which the position of the weight is regulated; neither do we claim the ratchet wheel and worm pinion, moved by a pawl or click, from the lay, as these have before been used.

What we claim is, effecting and regulating the let-off motion by the variable counterpoise lever, in combination with the sliding worm pinion, when said worm pinion is acted on by the yarn beam through a direct strain communicated to it by the tension of the warp, the whole arranged and combined as specified.

Turning Irregular Forms—By Lauren Ward, (admr. of Richard Ward, deceased,) J. B. Hubbell and H. C. Hubbell, of Naugatuck, Conn.: We are aware that machines have been made for turning irregular shapes, by means of sliding centre grooves, guides, patterns, cams, &c., and that cutters have been so formed and arranged as to assist the cams, &c., in giving the shape to the article: we therefore do not claim either of these, as such, as our own invention, but we claim the use of a cutter wheel for turning irregular forms, the cutters being so arranged that the pattern may be disclosed in reverse, on its surface, when combined with the feed motion described, so that in turning said cutter wheel, the desired irregular shape will be given to the article, without using guides or patterns, when the whole is combined and made to operate as described.

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AGENTS FOR

### GEORGE VAIL & CO., Speedwell Iron Works,

Have constantly on hand Saw Mill and Grist Mill Irons, Brass Screws, Bogardus's Horse Powers, and will take orders of Machinery of any kind, of iron and brass; Portable Saw Mills and Steam Engines, Saw Gummers of approved and cheap kinds, Gearing, Shafting, large and small, cast or of wrought iron.

April 17. 1 y.

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## FOR SALE,

## IMPROVED SHORT-HORN & ALDERNEY CATTLE,

Of different ages; the greater part of them bred on the farm of Thomas P. Remington, Esq. Many of the Short Horns are descendants of the herd of the late Mr. Bates, of Kirkleamington, England, justly celebrated as one of the best and most scientific breeders of the age. The Alderneys have been bred directly from the best imported Stock. The Cows are unrivalled as rich Milchers. Apply to

**AARON CLEMENT, Agent**

for the purchase and sale of improved Stock, &c.,

Sept. tf. **Cedar Street, above Ninth Street, Philadelphia.**

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## FARMERS' BOILERS, OR LAUNDRY KETTLES,

**OF ALL SIZES, FOR SALE BY**

## BARTLETT, BENT & SON,

**No. 238 WATER STREET, New-York.**

Mar. 1y.*

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## REDUCTION IN THE PRICE

OF

## BOGLE'S HYPEREON FLUID,

**FOR RESTORING, PRESERVING and ADORNING**

THE

## HAIR,

To the following low rates, viz:—Bottles formerly sold at 50 cents reduced to 25 cts. Bottles formerly sold at 75 cents reduced to 50 cts. " $1.00 " " 75 "

---

THE many worthless imitations of this celebrated Hair Restorative, palmed on the public under the lure of cheapness, has determined the Inventor to crush them, by selling his famous "Fluid" at even a lower price than they can afford to sell their vile trash. At the same time he assures the public that the "Hyperion" will always continue to be as good as heretofore, which has given it celebrity throughout the globe. This, with Bogle's "Electric Hair Dye," and other preparations, are sold by his Agents every where in the United States and Canadas.

Dec. 6t.*

# MILLS AT PATERSON, N. J.

FOR SALE OR TO LET, the COTTON MILL, LOT, and WATER PRIVILEGE, known as the Essex Mill. For Particulars inquire of

JOHN COLT,
President of the Paterson Manufacturing Company.

Also, the MILL, LOT, and WATER PRIVILEGE, formerly occupied by Plummer Prince as Print Works. For particulars apply to

THOMAS O. SMITH,
Agl. Society U. M.

Paterson, Dec. 28th, 1852. [Jan. '53-3m.1505.]

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**PATENTS, INVENTIONS, &c.**

J. H. BAILEY, Agent for the procuring and sale of Patent Rights for this country, Great Britain and the Continent.

MECHANICAL DRAWINGS.

Mechanical and Architectural Drawings executed in all kinds of Perspective, with dispatch and at moderate prices. Office, Tryon Row, No. 5, opposite City Hall. May 29—tf.

HOWLAND, WOOD, ENGRAVER, 69 NASSAU ST. N.Y.

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# EXCELSIOR!

## SPRING FASHION FOR GENTLEMEN'S

# HATS.

BEEBE & Co., 156 Broadway, keep constantly on hand an extensive assortment of HATS of the most fashionable styles, which for lightness, beauty, elasticity and durability, are unequalled by any other establishment in the city or in the country. Mar. 1853.

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# CHOICE POULTRY

FOR SALE,

Comprising the following Varieties, viz.:

## COCHIN CHINA

AND

## CANTON FOWLS.

BUFF, BROWN, BLACK, AND WHITE

## SHANGHAES.

## CHITTAGONGS,

OR

## GRAY SHANGHAES.

—ALSO—

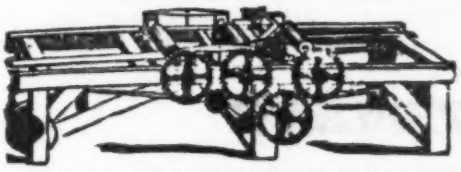
SUMATRA GAMES.

THE subscriber offers for sale Domestic Poultry of the above varieties, warranted true to their name, and purely bred — *equal in every respect* to any stock in the country. Orders for the same, addressed to the subscriber, will receive prompt attention.

**CHARLES SAMPSON, West Roxbury, Mass.**

# 1852-56.

## WOODWORTH'S Patent Planing, Tonguing, Grooving, and Rabeting Machine.



RECENT Decisions and Jury trials having fully and finally established all the claims of the Woodworth Patent, the subscriber is now prepared to furnish the most perfect planing machines ever constructed, and to license parties to use them in the counties of Allegany, Broome, Cattaraugus, Chenango, Columbia, Duchess, Fulton, Madison, Montgomery, Otsego, Putnam, Queens, Rockland, Suffolk, Tioga, Tompkins, Ulster, Washington, Westchester, Wyoming, Yates, and the other *unoccupied towns and counties in the State of New-York; and in the northern half of the State of Pennsylvania*, in the counties of Bradford, Crawford, Clinton, Elk, Lawrence, Lycoming, Luzerne, Mercer, M'Kean, Pike, Potter, Susquehanna, Tioga, Wayne, Warren, and Wyoming.

THIS JUSTLY CELEBRATED MACHINE was patented December 27, 1828, and the patent having been extended to the 27th day of December, 1856, it has now FIVE YEAR'S UNEXPIRED TERM. This machine, at one operation, reduces to a thickness, and planes, tongues, grooves, beads, and rabets in the best manner, 3,000 FEET OF BOARDS OR PLANK IN AN HOUR; and is also extensively used for planing, sticking, &c., door, sash, and blind stuff, and for sticking mouldings. All kinds of planing are performed by it in a better manner, and more expeditiously and cheaply, than it can be done by any other machine. The price of a complete machine is from $150 to $760, according to size and capacity. From 4 to 10 horse-power will drive the machine, and it will run for years without repairs.

Nine tenths of all the planed lumber used in our large cities and towns is now dressed with Woodworth's Machines. Those manufactured by the subscriber may be seen in constant operation in the Steam Planing Mills at Albany, Astoria, Canisteo, Dunkirk, Elmira, Flushing, Gibson, Jamestown, Leroy, Lockport, Newburg, Olean, Stapleton, Syracuse, Warrensburg, &c.

For Machines and Rights to use them in the unoccupied towns and counties in New-York and the northern half of Pennsylvania, apply to

JOHN GIBSON, Planing Mills,
Albany, N. Y.

Apr. 17-tf.

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## Manufacturers' Supply Store.

# OSCAR SCHENCK & CO.,

### No. 132 WATER STREET,

(Corner of Pine,) NEW-YORK.

DEALERS in Cotton, Woollen, Silk, and Carpet Manufacturers' Articles, and manufacturers of

WEAVERS' REEDS, HEDDLES, BOBBINS, SPOOLS.

Agents for the sale of the latest improved Shearing and Napping Machines, Wool Pickers, Cloth Winders, Regulators, Satinet Warps, &c. Oils, Sperm, Lard and Olive, and Oil Soap.

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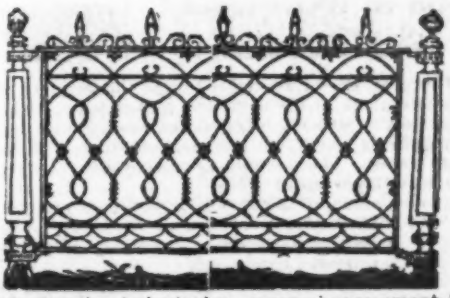
## NEW-YORK WIRE RAILING WORKS.



SPECIAL attention is invited to a new improvement in the manufacture of *Wire Iron Railing and Grating*, for all purposes where wood, cast or wrought iron are used, at half the cost; to wit,—for Cemeteries, public and private grounds, farms, balconies, verandahs, alcoves, &c., from 50 cts. to $2 per lineal foot.

*Portable* and *permanent* Wire Fence for railroads, farms, parks, lawns, &c., manufactured on an entirely new plan, from 9 to 18 cts. per foot, 4½ feet high, with Iron Posts.

The *Portable Iron Bedstead*, exceedingly ornamental, is so constructed as to fold up into a convenient form for transportation, and only requires to be seen to be adopted.

N. B.—All kinds of Wrought or Cast Iron Buildings made to order, and Designs and Circulars procured by addressing the manufacturer and proprietor,

JOHN S. WICKERSHAM,
240 Broadway.

Warerooms of the New-York Patent Machine Shop.

Works 59 and 61 Lewis street.

Agents, C. B. C. & Co., 215 Pearl street.

Medals have been awarded for the above, both by the Am. Institute of N. Y., and by the Franklin Institute of Philadelphia.

Mar. 13-1y.

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## George W. Putnam's

PATENT

# SAW-FILING MACHINE.

THE Subscriber [sole proprietor of the above Patent] keeps Machines constantly on hand at Glenn's Falls, Warren Co., N. Y. Will ship to order, to any part of the United States. Putnam's Machine, attended by one man, will file more saws in a given time than three men by hand in the old way, and do the work much better, at a great saving of files and saws. Lumbermen will find it to their interest to have one of these machines upon their mills. Terms for a single Machine, with right of use, Seventy-five Dollars.

ALBERT H. CHENEY.

July 17, 1852.

# QUARTZ MINING MACHINERY

THE Subscriber is extensively engaged in manufacturing Machines for stamping Quartz Rock, for Virginia and California, and has made several improvements by which he can pulverize more than three times the quantity of Quartz Rock, and with less power, than any other machinery in the country.

Also an improved Amalgamator by which every particle of gold can be collected. Miners who have used the Erasters or shaking tables, and have collected a large amount of sand, can use these machines to work the sand over, paying them a han some profit.

Persons wishing to go into the Quartz mining business wou do well by calling on the subscriber, who has had several year experience in manufacturing machinery for mining.

Mar 27-1y. WM. BURDON, *Machinist*,
102 Fulton street, Brooklyn.

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## NEW IMPROVEMENT
IN
# PLANING MACHINES.

HAVING received letters patent for my New Improved Planing Machine for planing boards and planks, I now offer for sale Machines and Rights for States, Counties, or Cities. My Improved Machine is unlike all others in its operation, and it will produce more work and of better quality than any others now in use. The principles of its operation are simple, as there are no gear or belts in or about the machine, these being all placed beneath the floor. The amount of work done is only limited by the number of persons feeding the machine. A matching apparatus works in connection with this machine, by which the Boards are planed and matched in the same operation. Th planing and matching are superior to that produced by the ha plane; and both sides of the board are planed at the same ti if desired.

One of these machines will be in full operation at the Machi Shop and Foundry of Messrs. F. & T. Townsend in this city b the 1st of June next, where it can be seen.

GEORGE W. BEARDSLEE,
Residence 764 Broadway, Albany.

June 5th.

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## A. HALL'S
# Fire-Brick Works,
## PERTH AMBOY, N. J.

A LARGE stock of the best No. 1 Fire Brick constantly on hand. Vessels of any draft can load at any stage of the tide and season of the year.

SHAPES.—Large and small Bull-Heads, in walls, from 5 feet to 8½ feet circle; Wedges, Split Brick, Soaps, Cupola, for any circle, from 18 inches to 30 inches, constantly on hand.

KAOLIN of the best quality.

ONE MILLION Bricks can be made at this factory in six month and none are made from October to April. All orders for u usual shapes should be given in the Spring, as bricks are *bette* and made much *cheaper* in the *summer months*. Vessels loade with dispatch. Orders promptly executed. Mar. 3, 1852.

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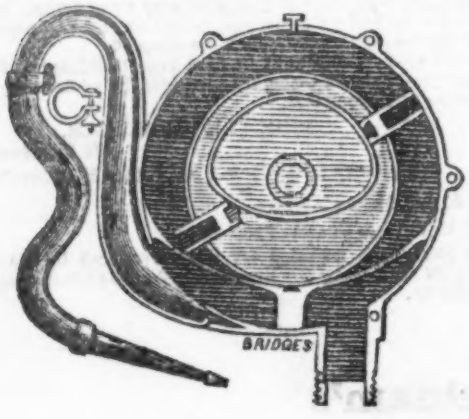
# A. W. CARY'S ROTARY FIRE-ENGINE PUMPS.




THE Inventor, after thoroughly testing this engine pump, (fo the past two years,) feels confident that it is not equalled b any thing now in market, in the way of raising or forcing water the motion being rotary, the stream is constant, without the ai of an AIR vessel. The packing is self-adjusting, very durable and cannot well get out of order.

These pumps are well calculated for all the purposes for which pumps or hydrants may be used, viz., Factories, Steamboats, Tanneries, Breweries, Distilleries, Railroads, Water Stations, Hotels, Mines, Garden Engines, &c.

Among the many testimonials given of this pump, is a gold medal awarded at the last great Fair of the American Institute.

No. 1 is a house or well pump and domestic Fire Engine, and will raise from 20 to 30 gallons per minute.

No. 2 will raise 100 gallons at 120 revolutions.
No. 2½ " 200 " 120 "
No. 3 " 300 " 120 "

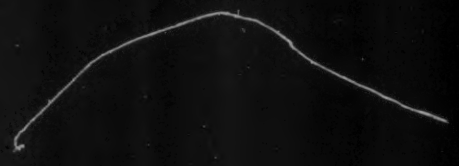
The quantity raised can be doubled, by doubling the revolutions. These machines are manufactured and sold by the subscribers at Brockport, N. Y., also in this city, 48 Courtland street, (corner of Greenwich,) by J. C. CARY.

Sept. 18-1y. CARY & BRAINERD.

---

# Machinists' and Manufacturers' Tools.

O. SNOW & Co., Union Works, Meriden, Ct., having increased their facilities for manufacturing Lathes, Planers, &c., have now on hand, finished and finishing off, Slide Lathes, of a variety of sizes and lengths, at prices varying from $125 to $900, according to size and finish; also, Hand and Power Planers for Iron, 2, 3½, 6, and 10 feet Beds. Milling Machines, Hand Lathes, with or without Iron Beds, comprising six different sizes, all of the most approved construction, and warranted of the best quality of work. Nov. 13-6m.*



# BRIDGEWATER PAINT,

MANUFACTURED BY THE

## BRIDGEWATER PAINT MANUFACTURING CO.,

### NEW-JERSEY.

THE Company have now on hand a supply of this paint, which they offer to the public as the best article known for roofs and outside work on houses, or for brick and wood work generally. They can confidently recommend it as the most perfect protection from sparks and cinders, and therefore admirably adapted for decks of steamers, rail-road cars buildings and bridges, tow-boats, &c. It renders any thing upon which it is used perfectly water tight, and must therefore come into general use as a covering at all exposed to the rain. The strongest testimonials of the virtues of this article from officers of the army, superintendents of rail-roads, Insurance Companies, captains of vessels, painters, &c., may be seen, together with specimens on tin, wood, canvass, &c., at the depot of the Company. For sale, dry in packages of 200 lbs. and upwards, and in kegs of 25, 50, and 100 lbs., by

Feb, 1853.

**R. BOGERT, General Agent,**
125 PEARL AND 78 BEAVER STREET.

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# PUMPS, FIRE ENGINES,

## FOUNTAINS, &c.

The subscriber manufactures Double-Acting Lift and Force Pumps, which from their simple constructions and little liability to disorder, (or when in any way deranged, they are very readily examined for the trouble,) are well calculated for Southern and West India Markets, for Factories, Mines, Railroad Water Stations, Breweries. Tan Works, Stationary Fire Engines, Ships, Steamboats, Family Purpose, Hydropathy Establishments, or for any purpose for which Pumps may be required. I manufacture them of any size required.

### VILLAGE AND FACTORY FIRE ENGINES.

They have a Double-Acting Lift and Force Pump, they are light, easily handled, and worked by four men.

### CISTERN AND WELL PUMPS,

for any depth required, either for manual or other forms of power. They are entirely of metal.

### GARDEN ENGINES.

GARDEN ENGINES with a small size Double-Acting Lift and Force Pumps, so arranged upon two wheels that one person can wheel them from place to place, and are well calculated for Agricultural and Horticultural purposes, Washing Windows, and can be used in case of fire.

### ORNAMENTAL CAST IRON FOUNTAINS,

Of various descriptions and sizes, with Jets of various descriptions, Copper Riveted Hose of all sizes, used for fire purposes, Molasses, or Locomotives. Lead, Cast Iron, Wrought Iron, and Gutta Percha Pipes. Brass Coupling of all sizes and descriptions. Copper Work, &c., &c

Purchasers are respectfully invited to call, or any communication by mail will have immediate attention.

**G. B. FARNAM,**
Feb. 1853. **34 CLIFF STREET, (up Stairs,) NEAR FULTON.**

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# WOODBURY'S

# PATENT PLANING MACHINES.

I HAVE recently improved the manufacture of my Patent Planing Machines, making them strong and easy to operate, and am now ready to sell my 24-inch Surfacing Machines for seven hundred dollars, and 14-inch Surfacing Machines for six hundred and fifty dollars each. I will warrant, by a special contract, that ONE of my aforesaid Machines will plane as many boards or plank as two of the Woodworth Machines in the same time, and do it better and with less power.

I also manufacture a superior Tonguing and Grooving Machine, for three hundred and fifty dollars, which can be either attached to the Planing Machine, or worked separately.

JOSEPH P. WOODBURY, Patentee,

Nov. 21-1y * Border street. Boston, Mass.

---

## CHARLES F. MANN,

## FULTON IRON WORKS, TROY, N. Y.

BUILDER of Steam Engines and Boilers of various patterns and sizes, and with the late improvements: also, his improved portable Steam Engines and Boilers combined, occupying but little space, economical in fuel, safe and easily managed. These Engines are well adapted to Railroad Depots, for sawing and pumping, requiring no brick to set them. Double Action, Lift, and Force Pumps, for pumping Mines, &c.; Shafting and Pulleys, for Factories, Tools for Machine Shops. Brass Castings and Machinery made to order at the shortest notice.

March, 3m*

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# IRON FOUNDERS' MATERIALS.

VIZ: No. 1 SCOTCH PIG IRON; No. 1, 2 and 3 AMERICAN PIG IRON of favorite brands. Iron and Brass MOULDING SAND; Fire Sand, Fire Clay, Core Sand and Core Flour in barrels; Scotch Patent Crown FIRE BRICKS, square, arch and circular, for cupolas; Pulverized pure Black Lead, Soapstone, Sea Coal, Anthracite and Hardwood Charcoal, FOUNDRY FACINGS of approved quality, for sale by

**G. O. ROBERTS & Co.,**
Office, 135 WATER STREET, (cor. of Pine.) NEW-YORK.

# BELLS! BELLS! BELLS!

THE subscribers manufacture and keep constantly on hand, Church, Factory, Steamboat, Locomotive, Plantation, and School-house Bells, varying in weight from 10 lbs. to 4,000 lbs., with the most approved hangings.

At this Establishment small Bells pass through the same process in manufacturing as large ones, and we flatter ourselves that the Bells turned out at this Foundry are superior in point of tone and workmanship to those of any other in the Union.

We have 13 Gold and Silver Medals which have been awarded for the *best* Bells. The patterns have been improved upon for the past thirty years. Communications by mail will receive prompt attention. Orders for Bells of any size can be filled as soon as received.

Address, at West Troy, N. Y., **A. MENEELY'S SONS.**

**Hitchcock & Co., Agents,** 116 Broadway, New-York.

MATHEMATICAL INSTRUMENTS FURNISHED, OF THE BEST DESCRIPTION. Dec. '52, eomly.

# WILDER'S PATENT SALAMANDERS,

## WITH RICH'S IMPROV MENT.

**The only Safes with Wild-**


**er's Patent & Rich's Patent**

COMBINED, ARE MADE BY

**146 Water St.,**

**STEARNS & MARVIN,**

**New-York.**

*The sole Proprietors of Rich's Patent, and joint Proprietors of Wilder's Patent with Silas C. Herring.*

**THE GREAT FIRE IN CHILLICOTHE, ONE THIRD THE TOWN BURNT TO ASHES!**

CHILLICOTHE, OHIO, Tuesday, April 13th, 1852.

MESSRS. STEARNS & MARVIN—Gentlemen: Yours of the 5th is at hand. In reply, every Safe in the fire, except yours, has proved good for nothing. I lost a large Safe—it was perfectly destroyed; but in the small Salamander I bought from you, nothing was injured.

Your obedient Servant, W. T. CLEMSON.

The above letter shows that in a real hot fire RICH'S SALAMANDERS are the only Safes to be depended upon. In the Pearl street fire, eleven Safes, of different makers, were totally destroyed, Rich's Safe alone bidding defiance to the flames, preserving notes, bonds, and mortgages, to the value of $100,000. The Chillicothe fire is a parallel case—every Safe but Rich's is destroyed. These repeated occurrences prove incontestibly that Wilder's Patent Salamander, with Rich's improvement, are the best Safes made in the United States, or in the whole world. They can be had at the depot, No. 146 Water Street, and at the Factory, corner of St. Mark's Place and Avenue A, New-York. STEARNS & MARVIN.

ALSO AT THE FOLLOWING AGENCIES:

Isaac Bridge, New Orleans, La.; L. M. Hatch, Charleston, S. C.; Thompson & Oudesluys, Balt., Md.; Holyoake, Lowns & Co., Memphis, Tenn.; Eddy & Morley, Toledo, O.; Allis & Howes, Evansville, Ind.; S. Shephard & Co., Buffalo, N. Y.; Walter K. Marvin, Lockport, N. Y.; Barney Brothers, Mobile, Ala.; Chas. H. Campfield, Savannah, Ga.; Hall and Moses, Columbus, Ga.; DeRosset & Brown, Wilmington, N. C; W. Randall, St. Paul, M. T.; Morly & Raynolds, Cleveland, O.; Alfred Wright, Roch., N. Y.; J. Hutton, Montreal, Ca.; Starr & Mason, Camden, N. J.; J. H. Westcott, Plattsburgh, N. Y.; Ashley Brothers, Ogdensburgh, N. Y.; A. B. Merrian, Oswego, N. Y.; Dana & Co., Utica, N. Y.; Norton, Bradley, Co., Syracuse, N. Y. 1 yr.* Jy.'52

# PORCELAIN DOOR KNOBS

AND

# BUILDING HARDWARE.

THE undersigned would respectfully invite the attention of Owners, Architects and Builders to their extensive assortment of the above goods; they have the largest variety of decorated Porcelain Door Knobs ever offered for sale in this country, with Shutter, Drawer and French Window Knobs, Bell Pulls, Bell Levers, Mouth Pieces, and Finger Plates, to match, which have taken the first premium at the three last successive Fairs of the American Institute. The assortment of House and Store Door Locks and Latches is complete, comprising every size and quality, in Wrought or Cast Iron; also, French Window, Folding and Sliding Door Setts of all kinds.

BALDWIN & MANY,

49 John street, corner of Dutch street.

Sole Agents for Dixon's Black Lead Crucibles, and Hoop Church, Steamboat and Factory Bells. Dec. 20-